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Production Continues Downward Course

Highest production in 1931, week ending Aug. 8, average daily output 2,551,807 bbls. Peak of U. S. production, week ending Aug. 24, 1929, average 2,975,435 bbls.

East Texas Falls Off 48,445 Bbls. per Day. Court Decision Not Expected to Influence Curtailment in That Area

By James McIntyre

Lowest daily average crude oil production in the United States during 1931 was for week ending Sept. 5 with average output of 1,736,007 bbls.

A decline of 24,224 bbls. in the average daily production of crude oil in the United States is noted in the estimates of production in the past week. The three East Texas Pools fell off 48,445 bbls. per day, bringing their production down to 279,071 bbls. The causes given for this decline are various, but principal among them was the flooded condition of the area in which the field lies, making it difficult if not impossible to get to the connections and open the wells for their production periods. The production of all Texas for the past week was on a level with that of the closing days of last March.

Owing to the observance of Washington's birthday on Monday the American Petroleum Institute announced it would be unable to supply figures on the past week's refinery operations in the United States in time for this issue of The Oil and Gas Journal, but using the previous week's figures on gasoline stocks and comparing them with stocks as of a like period in October, 1931, it may be seen that in the intervening four months a total of 13,177,000 bbls. of gasoline has been added to stocks on hand. On the basis of the estimates on supply and demand for the winter months compiled by the American Petroleum Institute's committee on economics, this is not excessive. In fact last week's total of 43,430,000 bbls. of gasoline in storage is very close to the estimate of the quantity of gasoline the industry should have at this time to provide for its spring requirements.

However, the steady accumulation of gasoline stocks in the face of the steady decrease of crude oil production does not set well with the producing end of the industry, which is hoping for better prices for refined products so that the producer may profit in turn.

The decision of three federal judges in the Constantin-Sterling case has caused little alarm in East Texas as it is believed that in any event the field will continue on a curtailed basis in response to industrial needs and a strong public opinion in that area.

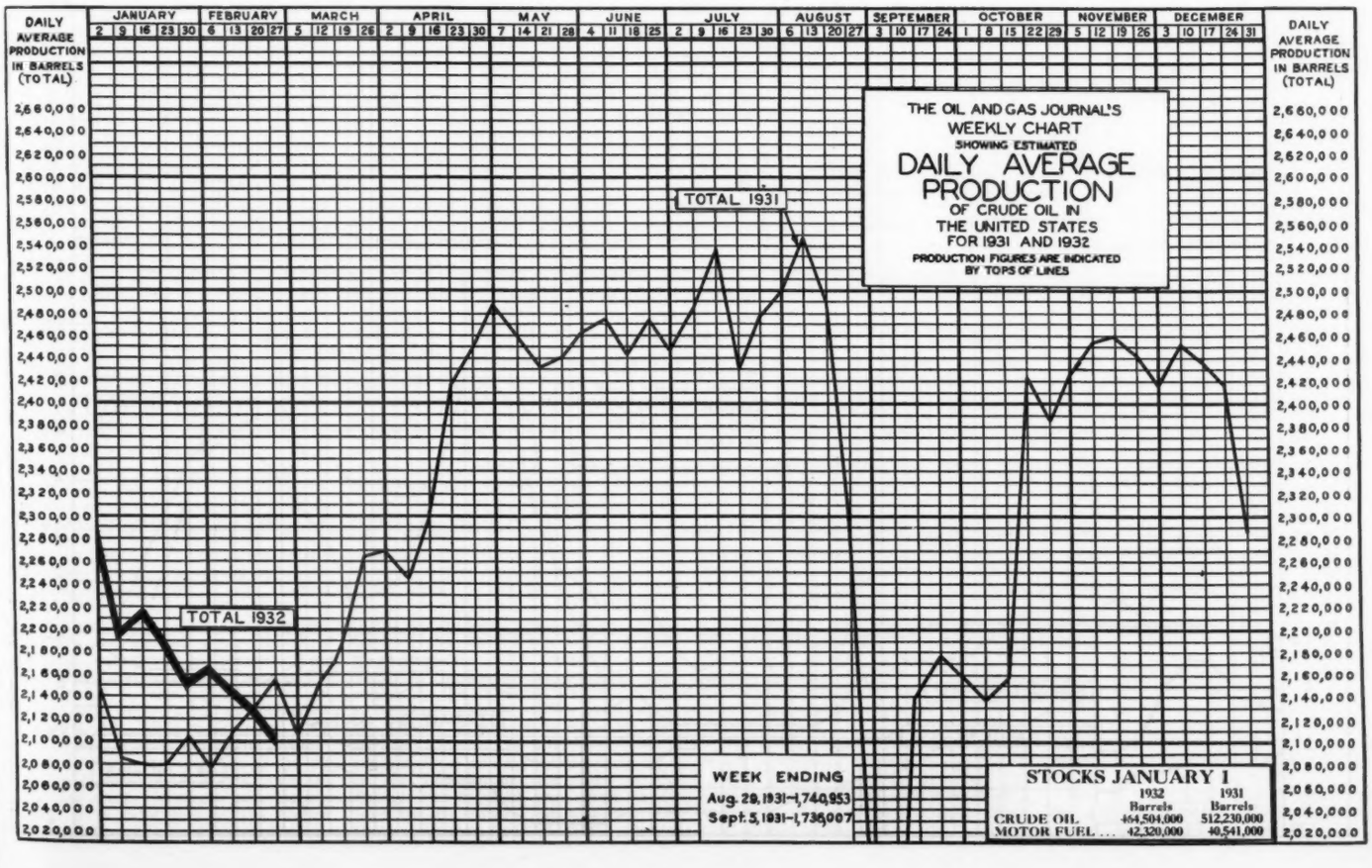
The curtailment and proration sentiment in East Texas is pronounced and it would be dangerous to go against it. This well-known fact is expected to deter die-hard operators from overproducing their wells.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of crude oil in the United States for the week ended February 20, and a comparison with the previous week follows:

	Feb. 20	Feb. 13
Oklahoma—		
Oklahoma City	80,090	81,200
Seminole-St. Louis	129,403	120,025
Remainder of State	204,072	203,125
Total Oklahoma	413,565	404,350
East Texas—		
Kilgore	87,056	103,509
Lathrop	98,195	114,945
Joiner	93,820	109,062
Total East Texas	279,071	327,516
West Texas	175,962	173,237
North Central Texas	72,048	72,355
Texas Panhandle	49,415	48,794
East Central Texas	55,236	50,310
Gulf Coast Texas	106,152	105,244
Southwest Texas	59,545	59,561
Total State of Texas	797,429	837,017
Kansas	98,980	98,650
North Louisiana	28,495	28,725
Gulf Coast—Louisiana	27,609	28,295
Arkansas	33,500	33,535
Eastern Fields	120,000	118,000
Rocky Mountain area	83,639	81,869
California—		
Santa Fe Springs	66,000	66,500
Long Beach	79,500	76,750
Playa Del Rey	19,750	20,750
Elwood	17,000	17,000
Kettleman Hills	60,750	59,250
Remainder of State	260,000	259,750
Total California	503,000	500,000
Total United States	2,106,217	2,130,441

→ **Decrease 24,224 Bbls. Daily** ←



Dull Trading in Oklahoma Market

Prices Except for Low Antiknock Gasolines Steady. Higher Octane Requirement for Ethyl Gasoline Market Factor

By C. O. Willson

Spot trading in practically all refinery products in the Oklahoma (Group 3) market was dull during the past week. With the exception of low octane gasoline, prices were unchanged although more buyers were able to cover their requirements at the low of market spread.

The federal court decision regarding the martial law control of the East Texas operations, which is explained in detail elsewhere in this issue, was first interpreted as a bearish development in Oklahoma and other Mid-Continent refinery markets. It was thought that the decision would result in more crude oil being available to refiners with plants in the East Texas Field and refining centers close to the field at distress prices and this would mean increased quantities of gasoline thrown on the market. Due to this feeling, the low octane gasoline was freely offered to buyers at prices at least one-eighth cent under the quotations in effect a week previous. On Monday and Tuesday, it became known that the court decision for the immediate future at least would not disturb the East Texas proration operation and in well informed circles the opinion was expressed that the field would continue to operate under a proration plan regardless of federal court decisions. It was hoped that this position would prevent any further collapse in gasoline prices.

Higher Octane Firm

While the low octanes were weak the higher octane gasolines starting at 57 were firm. Quotations on these higher octane gasolines vary more widely than in the case of the low octane gasolines. While the middle grade quotation covers gasolines with octane rating varying from 57 to 65, buyers and sellers recognize price differences within this range. Buyers who are purchasing a gasoline which they can sell as a regular grade at their stations usually desire a gasoline with a minimum antiknock rating of 60 octane and some insist on a minimum of 62 or 63.

Sellers who are in a position to furnish this gasoline are getting as much as three-fourths cent premium over the low octane gasoline. At the same time there are refiners willing to furnish a U. S. Motor grade of 57-65 octane at one-half cent over the under 57 octane material. Most of this gasoline has an octane rating between 57 and 60. In this connection there is competition from the natural gasoline industry and crude oil rectifying plants. Due to the slow demand for the regular grades of natural gasoline some of the manufacturers are stabilizing part or all of their output so that it can be sold direct as motor fuel or can be blended in large percentages with a low octane U. S. Motor gasoline resulting in a motor fuel of more than 60 octane, high gravity and better than average volatility. The specifications of these stabilized natural gasolines vary widely. Usually the vapor pressure is under 16 pounds with a minimum recovery of 97. Prices range from 2¼ to 3½ cents. In Oklahoma some of the gasoline is coming from crude oil topping or rectifying plants in the Oklahoma City Field. At these plants the light ends of exceptionally high gravity crudes are removed before the crude oil is delivered to pipe lines. This cut from the crude is especially adaptable to the manufacture of low boiling point motor fuels.

Due to the slow demand for low octane gasolines and the relatively strong demand for the better grades, some observers feel the spread between motor fuels under 55 octanes and above 60 octanes will spread to at least 1 cent a gallon by early summer when the maximum summer demand is under way. Most of the low octane gasoline which is straightrun material from both small and large refineries has an octane rating under 53, some of it being as low as 45. There is no question that this gasoline is not satisfactory motor fuel regardless of distillation range for most of the cars sold over the past two years and the new cars which will be sold during 1932. The larger distributors are rapidly establishing a minimum requirement of 60 octane for regular grades of motor fuel and several will step this up to between 65 and 70 by late spring.

The economic significance of this trend is obvious. "The handwriting is on the

(Continued on Page 95)

REFINED MARKET BAROMETER

Price changes in refinery tank car movement were local in scope during the past week. Substantial price reductions were made effective in California pale and red neutrals but East Coast and Pennsylvania neutrals were firm with price advances in some grades of bright stocks. Refinery gasolines in most areas were not in active demand and prices reflected this weakness. The export demand was aided due to the fact that buyers in England were anxious to secure delivery before the new tariff becomes effective March 1. No general changes were reported in fuels. The demand for furnace oil material is fairly active but the heavy fuels are moving slowly. Natural gasolines were unchanged both in California and the Mid-Continent. Better export demand for wax.

Mid-Continent—Fair demand for high octane gasolines but low octane material sluggish and prices lower. Kerosene, tractor fuel and furnace oil firm and prices unchanged. Heavy fuels and gas oil slow. Natural gasolines unchanged.

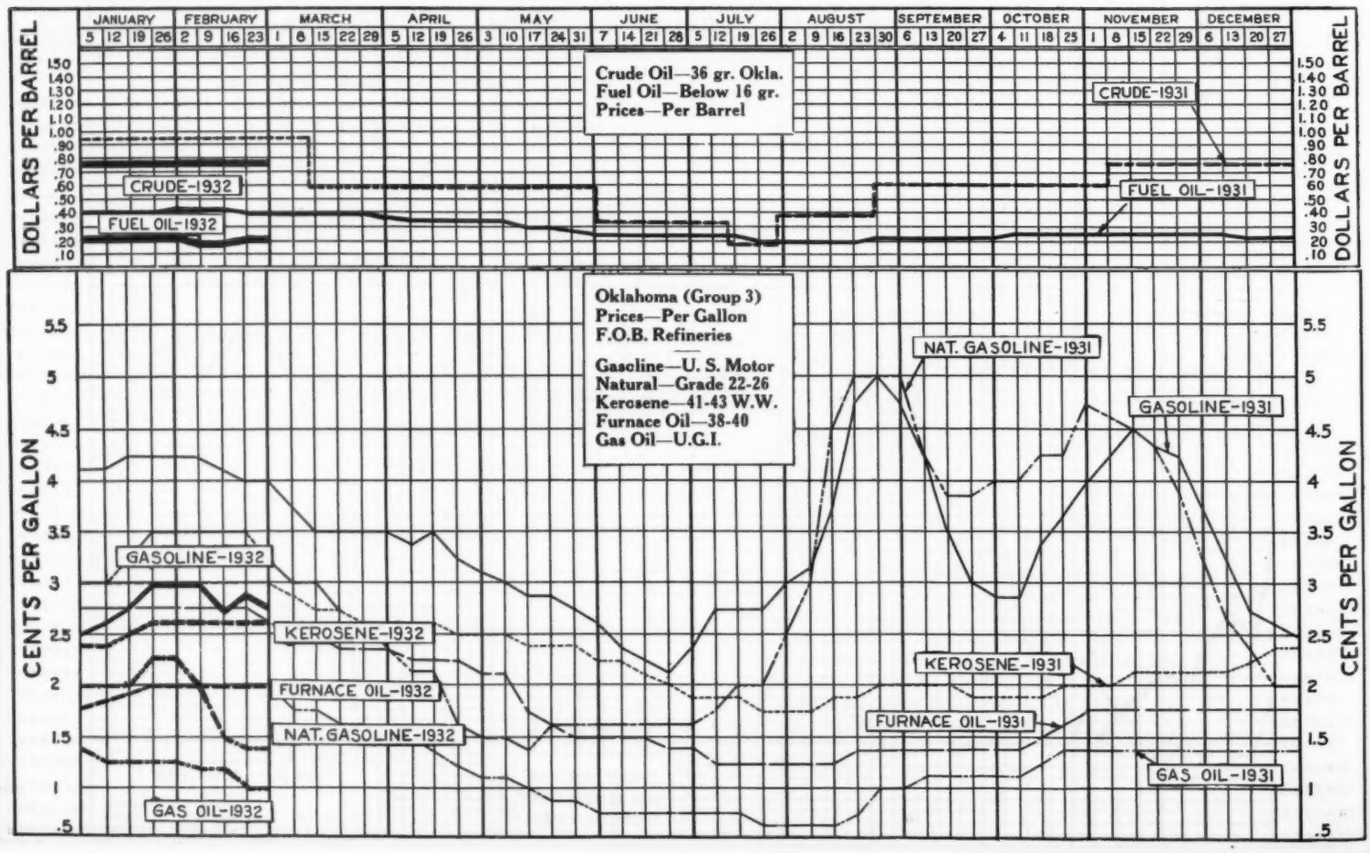
East Coast—Export buying of lubricating oils and wax active for delivery to England before March 1 when new tariff becomes effective, feature of market. Gasolines slow. Better demand for kerosene and furnace oil. Fuel oil and gas oil unchanged.

Chicago—Gasoline prices unchanged. Improved demand for special naphthas. Heavy fuels slow. Fair demand for furnace oils.

Gulf Coast—Weakness in pale and red neutrals and lower prices expected. Gasoline slow. Bunker fuel steady.

Pennsylvania—Better demand for cylinder stocks. No important changes in prices.

California—General reduction in pale and red neutral oils. Largest reductions in higher viscosity grades. Gasoline market unsettled.



No Injunction Issued in East Texas

Martial Law Held Without Warrant but Authority of Railroad Commission Recognized. Further Hearing on Conservation Rules

AUSTIN, Tex., Feb. 22.—After reviewing the evidence and the arguments in the case of Constantin and Wrather against Governor Sterling and General Wolters involving martial law in East Texas, the three-judge federal court, consisting of Circuit Judge J. C. Hutcheson and District Judges Randolph Bryant and W. I. Grubb, says:

The case involves merely the right of a citizen to relief against acts in deprivation of his property, and the questions of martial law and the power of the governor come up as incidental to the inquiry, and are drawn into it and affected by it only in so far as it is necessary to settle that inquiry.

It is perfectly clear that unless the defendants can maintain their proposition that they are ad hoc the State and therefore may not be sued, or that the declaration of martial law has superseded the Federal Constitution as the supreme law of the land, and during the time of its fiat continuance placed defendants above accountability to the courts, plaintiffs are entitled to equitable relief, for no clearer case of deprivation of rights inhering in private ownership of property under color of law, can be imagined than is here occurring. It could not be and it is not contended that under ordinary conditions, that is, martial law absent, a governor and the militia could expropriate the management of private property, as they are now doing. It remains only to inquire whether the defendants because of the proclamation find themselves so situated as that a court of the United States may not exert its jurisdiction upon complaint against their actions to inquire into them or if it may not under the undisputed facts obtaining, grant relief.

Looking first to defendants' contentions, we think it might reasonably be expected that in support of pretentions so vast, of authority so absolute and uncontrolled as here asserted, of power in the executive of a state by fiat to suspend not only the constitution of the state, but of the United States, to the extent of depriving their courts of jurisdiction to inquire into and redress grievances, defendants would point to enabling constitutional provisions, state or national, or at least clear and convincing authority supporting their claim.

We have examined the constitutional provisions which they rely on. We have examined every authority cited by them. We have found none, we conclude that none exist, which as against the claim of deprivation of property, supports defendants' claims to immunity from judicial inquiry and none which has even considered, much less declared that a court of the United States may not, by injunction, prevent the deprivation of property such as is here occurring.

Not Suit Against State

Upon the first proposition advanced, that this is a suit against the State and that as such it may not be maintained, the authorities overwhelm that this is a suit under the First Subdivision of Sec. 41 of the Judicial Code to redress the deprivation of property arising under the Constitution and laws of the United States (Holt vs. Indiana, 176 U. S. 70) and that as such it is not a suit against the State, but against persons in their individual capacities, to prevent them from enforcing statutes in themselves unconstitutional, or unconstitutional as attempted to be enforced and applied. That in such a suit, when it is found, that an individual acting under the assumed authority of the state as one of its officers, and under color of its laws has come into conflict with the superior authority of a valid law of the United States, he is stripped of his representative character and subjected in his person to the consequences of his individual conduct. The State has no power to impart to him any immunity from the supreme authority of the United States. In this suit plaintiffs invoke the exercise of the judicial power of the United States which, vested by the Constitution in its courts, extends to all cases in law and equity arising thereunder.

Chancery Jurisdiction

No exertion of this power rests on clearer or more certain grounds than that of its chancery jurisdiction. It is exercised uniformly throughout the nation unaffected by statutes, usages or customs of the several states. It is properly commensurate with every right or duty declared or necessarily implied by and under the Constitution of the United States, and its jurisdiction to inquire into a cause and determine whether it presents a matter of equitable cognizance may not be infringed or impaired by the constitution of any state or by any act or proceeding of the legislative, the executive, or the judicial branch of a state. Of the chancery jurisdiction no phase of it has a better settled basis, a more comprehensive and remedial scope than that which it employs to prevent persons acting under the authority or color of state laws, from denying the due process and equal protection which the Fourteenth Amendment guarantees. This must necessarily be so, for independent of each other in their respective spheres as are the state and Federal governments, the Constitution of the United States is the supreme law of the land, and the courts of the United States, as the repositories of Federal judicial power, are compelled to and will assert and vindicate its supremacy, to protect the rights of individuals, menaced by personal aggression masked under official power.

Not Above Courts

Defendants do not, they can not, point to any provisions of the Federal Constitution or statutes which exalts an officer of the state when acting beyond his power, above the authority of the courts of the United States; which subordinates the Fedeal Courts, acting within their spheres, to the authority of the officers of the state or which permits anything to "be interposed between the individual and the obligation he owed to the Constitution and laws of the United States, which can shield or defend him from their just authority, and the extent and limit of that authority the Government of the United States, by means of its judicial power, interprets and applied for itself."

It follows that plaintiffs' suit as alleged, being one to restrain the officers of the State from enforcing against them in a confiscatory way, the laws of that State on the ground that such laws or their enforcement are opposed to the Constitution of the United States, and particularly the Fourteenth Amendment thereof, this Court, organized as a statutory court under Sec. 380 has undoubted jurisdiction to inquire into the merits of the cause, and to adjudicate in accordance with its merits.

We reject them, as entirely without substance, contrary to the genius of the two governments, Federal and state, and opposed to the very conceptions upon which this government was founded and has been maintained, the contention that any officer of a state, whether acting in a civil or a military capacity, whether executive, legislative or judicial, can by proclamation or otherwise, erect himself above Federal Court inquiry, withdraw his actions affecting private property from judicial inquiry, and insulate himself from judicial process and the consequences of disobedience to judicial decree.

On Its Merits

We come then to an examination of the case upon its merits, first inquiring what are the provisions of the State Constitution under which this power is claimed, and next, whether in this State or in any other, any court, state or Federal, has ever declared that persons in an industry dominated and taken over by the executive of a state for the purpose and with the result of controlling production,—and kept under control, as this has been, for some six months,—are powerless to obtain injunctive relief against such executive aggression because of the fact that the governor has issued a proclamation of martial law, and is controlling the production of oil upon the ground that it is necessary to do so in order to prevent persons who would become enraged if production were not kept down to the figure they desire, from committing acts of incendarism and violence.

The provisions of the Constitution on which defendants rely are—

Art. 4, Sec. 1.—"The Executive Department of the State shall consist of a Governor, who shall be the chief executive officer of the State."

Art. 4, Sec. 10.—". . . shall cause the laws to be faithfully executed . . ."

Art. 4, Sec. 7.—"Shall be the commander-in-chief of the military forces of the State. . . . he shall have power to call forth the militia to execute the laws of the State to suppress insurrection, repel invasions, protect the frontier from hostile incursions by Indians, or other predatory bands."

The Legislature has made the following provisions:

"Art. 5889.—Whenever any portion of the military force of this state is employed in aid of the civil authorities, the Governor, if in his judgment maintenance of law and order will thereby be promoted, may by proclamation declare the county or city in which the troops are serving or any special portion thereof, to be in a state of insurrection."

Art. 5834 provides: "The Governor may order the active militia, or any part thereof, to assist the civil authorities in guarding prisoners . . . or discharging other duties in connection with the execution of the law as the public interest or safety at any time require."

Art. 5778 provides: "The Governor shall have power in case of insurrection, invasion, tumult, riot or breach of the peace, or imminent danger thereof, to order into active service of this state any part of the militia that he may deem proper."

Art. 5830 provides: "When an invasion of, or an insurrection in, this state is made or threatened, or when the Governor may deem it necessary for the enforcement of the laws of this State, he shall call forth the active militia or any part thereof, to repel, suppress or enforce the same."

Martial Law Unauthorized

It will be noted that nowhere in either the Constitution or the statutes is a state of war referred to, or the declaration of martial law authorized. It is nowhere provided that the governor may institute it, or that he may in any manner or under any circumstances, suspend the laws and deprive persons of access to the courts. Considering these provisions alone, we think the defendants' case fails for want of affirmative authority, in that the provisions they invoke do not contain the grant of power claimed.

But we do not rest our conclusion alone upon the silence of the Constitution in not granting such power, for it has by express provision withheld such power and prevented beyond peradventure, its there being implied. That the governor may, in his discretion, call out the militia, the Constitution does indeed provide. That the Constitution has prohibited to the governor the power by proclamation to suspend the Constitution and laws, the power to invest himself with a military character which will confer on him and the militia any extraordinary powers not given by the civil laws, or place them above the corrective reach of the courts as here contended, the Constitution of this State and the applicable authorities make perfectly clear.

Bill of Rights

Martial law, the law of war, in territory where courts are open and civil processes run, is totally incompatible with, it cannot co-exist with provisions such as are contained in Article 1, Bill of Rights of the Texas Constitution.

Sec. 12. "The writ of habeas corpus is a writ of rights, and shall never be suspended."

Sec. 12. "All courts shall be open."

Sec. 19. "No citizen of this State shall be deprived of life, liberty, property, privileges, or immunities except by due course of the law of the land."

Sec. 24. "The military shall at all times be subordinate to the civil authorities."

(Continued on Page 93)

RAILROAD COMMISSION READY TO ISSUE NEW PRORATION RULES

SAN ANTONIO, Texas, Feb. 22.—Chairman C. V. Terrell of the Texas Railroad Commission officially announced here Monday, after a conference with Commissioner Lon A. Smith, that the state railroad commission will temporarily withhold issuance of a new proration and conservation order for the East Texas Field pending developments in the martial law injunction case. He said the commission will stand ready to enter an order at any moment Governor Sterling may withdraw the martial law forces but since Governor Sterling has 15 days under the recent Federal court decision "and may secure a stay of the injunction for appeal to the United States Supreme Court" the commission has decided to wait until troop withdrawal actually is started to resume control of the field.

There was considerable confusion immediately after the announcement of the court's decision at Tyler. Governor Sterling, upon advice of legal representatives, assumed that he had been enjoined and ordered withdrawal of the troops from the Constantin-Wrather properties. Subsequent telephonic inquiry was reported to have brought from Judge Hutcheson a statement that "any four-year old child could understand that no injunction had been granted." The troops were then ordered back into the field and will remain pending further proceedings in court.

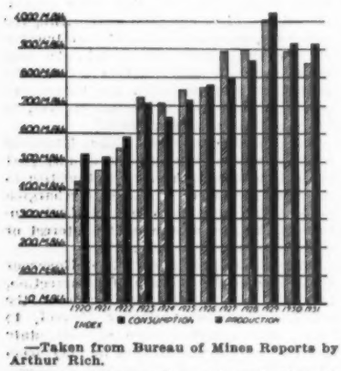
Future of the Oil Producing Industry

Troubles of Past Year Mental Rather Than Physical. Crude Oil Consumption Exceeds Supply. No Excessive Reserve

By Max W. Ball
Consulting Geologist, Denver, Colo.*

What I have to say applies to the business of producing oil, not to the business of refining oil and selling the products. If I use the term "oil industry" to mean only the "oil-producing industry" you will understand that a producer, and not a refiner or a marketer, is speaking.

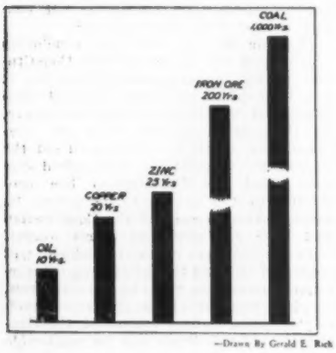
The future of an industry depends, obviously, on the amount of its product that it can sell, the cost to it of that product, and the price it receives. The



—Taken from Bureau of Mines Reports by Arthur Rich.

Figure 1—Consumption and production of petroleum in the United States.

price, in turn, depends on the amount consumed in relation to the amount produced. If consumption exceeds production the price will advance until production is stimulated and overtakes consumption. If production exceeds consumption prices will fall until production is discouraged, and drops back to the pace of consumption. Resolving price into its determining factors, therefore, we find that the future of an industry depends on the amount of its product consumed, on its ability to produce that amount at a reasonable cost, and on keeping production within the limits of consumption. If the cost of production is reasonably constant, the factors determining economic soundness are (1) assured continuity of consumption; (2) assured ability to produce the amount required, and (3) assurance against overproduction.



—Drawn By Gerald E. Rich

Fig. 3.—Known underground reserves in the United States. Number of years supply at present rate of domestic consumption.

This is merely a restatement of the law of supply and demand, and that law cannot be too often repeated or too greatly emphasized. We are prone to forget that the law of supply and demand is always operative, to think that it has been superseded or modified by this or that circumstance. The law of supply and demand is as fundamental in economics as the law of gravity in physics.

We must not forget that the law of supply and demand is not a physical law but a psychological law, having its root in human desires and incentives. For this reason the time and manner of its operation are affected by mental states, especially by those states, such as fear and confidence, which we may group under the term expectation. General demand for goods is now below normal, not so much from lack of desire or lack of the means to buy as because many people fear the failure of their means and many others expect lower prices. Oil prices dropped in 1931, not, as we shall see, because there was overproduction but because there was fear of overproduction.

This psychological factor of expectation may at times overshadow the physical factors, especially with regard to prices, and give results not warranted by the actual facts. As soon, however, as knowledge of the physical facts becomes general, expectation adjusts itself to them. The expectation factor is temporary in its effects, and in the long run may be disregarded.

Applying to oil the principles we have thus restated we find that the future soundness of the industry depends on a continuation of consumption of oil at not less than the present rate, ability to produce that amount of oil, and avoidance of oveproduction.

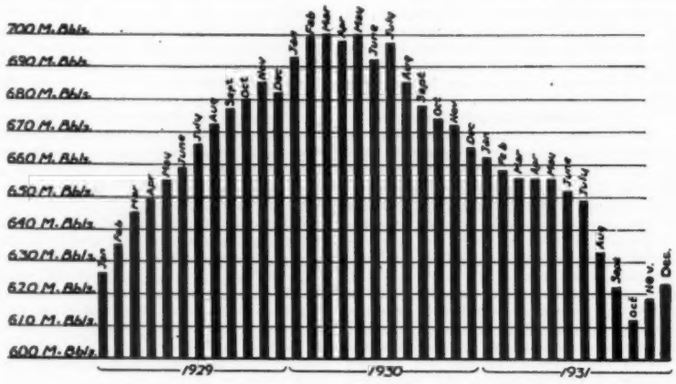
As to ability to produce, we may safely assume without argument that the demands of consumption can be met for some time to come, although, as will appear later, greater effort may soon be necessary to keep pace with increased consumption. For the present we may dismiss this factor, leaving two questions to be answered: Can we expect overproduction to be avoided, and can we expect consumption to be maintained or increased?

Is Overproduction Chronic?

Because periods of overproduction in the oil industry have been acute and spectacular many people think the industry has been in a chronic state of overproduction. Let us examine this belief in the light of facts. The following table shows production and consumption of crude oil in the United States from 1920 to 1931, inclusive:

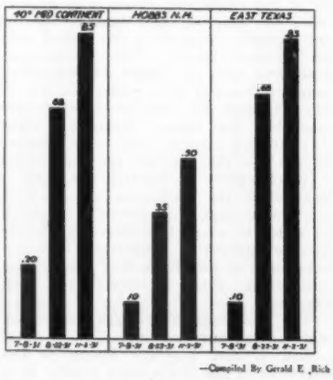
TABLE 1—UNITED STATES CONSUMPTION AND PRODUCTION
(U. S. Bureau of Mines)

Year	Consumption bbls.	Production bbls.
1920	530,532,000	442,929,000
1921	526,032,000	472,183,000
1922	592,432,000	557,531,000
1923	714,862,000	732,407,000
1924	662,205,000	713,940,000
1925	726,434,000	763,743,000
1926	779,881,000	770,874,000
1927	802,946,000	901,129,000
1928	860,935,000	901,474,000
1929	1,039,240,000	1,007,323,000
1930	923,085,000	898,000,000
1931	921,771,000	850,892,000
Total	9,180,355,000	9,012,135,000



—Taken from Bureau of Mines Reports by Arthur Rich.

Figure 2—Total oil stocks in storage—crude and refined oils.



—Compiled By Gerald E. Rich

Fig. 4.—Prices of crude oil—summer and fall of 1931.

In 7 of the 11 years, including the depression years of 1930 and 1931, we have consumed more oil than we have produced. These 11 years saw the development of the greatest series of spectacular fields in history, including among others Signal Hill, Santa Fe Springs, Ventura Avenue, Dominguez Hill, Kettleman Hills, Seminole, Oklahoma City, Hobbs, Mexia, Big Lake, Yates, Winkler, Van and East Texas, yet during these 11 years domestic consumption exceeded production by 168,220,000 bbls. On this record, overproduction can scarcely be said to be chronic.

The Facts of 1930-31

But, you ask, has not the industry just passed through a disastrous period of overproduction? The answer is no; it has not. In 1930, as the table above shows, consumption exceeded production by 25,000,000 bbls. In 1931, the year of "disastrous overproduction" and low prices, consumption exceeded production by more than 70,000,000 bbls. In the two years of this our depression we consumed in the United States 95,000,000 bbls. more than we produced.

Yes, you say, but imports from foreign fields more than made up the deficiency of domestic production. Did they? Let us take testimony on that point.

In any business the most convenient and convincing evidence of the relation of production to consumption is found in inventories. In the oil business inventories take the form of crude oil and oil products in storage. If the amount of oil in storage increases, production has outrun consumption; if oil in storage decreases, production has fallen behind consumption. Imports, exports and the many other factors that enter into and confuse the debate are silenced before this question:

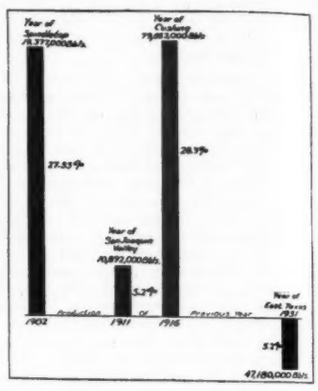


Fig. 5.—Comparison of conditions in past with 1931 production.

Did the industry store oil or withdraw it from storage?

On January 1, 1931, stocks of crude oil and oil products were 662,196,000 bbls., a little less than nine months' supply at our present rate of consumption. During 1931 we reduced this storage by 40,212,000 bbls., an average of 3,351,000 bbls. a month, or 110,000 bbls. a day.

From June 1, 1930, to January 1, 1932, storage was reduced 78,428,000 bbls. Since the peak in March, 1930, storage has been reduced approximately 11.1 per cent of its maximum volume. Did someone say overproduction?

What, then, caused the sharp drop in prices in the spring and summer of 1931? Not overproduction, but fear of overproduction. Great fields had been developed and were being produced at small fractions of their rated potential capacities. The greatest field of all was being developed and produced to full capacity with no regard for market outlets. If all fields were thrown wide open chaos would result and the industry would be ruined. The tremendous reserves in sight,

(Continued on Page 91)

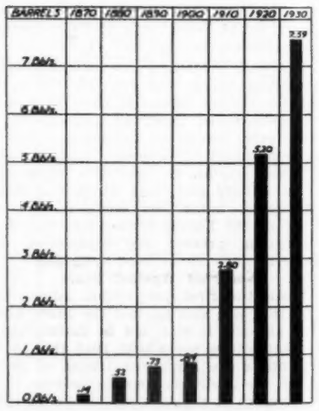


Fig. 6.—Consumption of crude oil per capita per year in the United States.

*An address before the joint annual meeting of the Colorado Mining Association and the Colorado Chapter of the American Mining Congress, Colorado Springs, Colo.

Total Oil Demand 93 Per Cent of Peak

Government Data for 1931 Show Exceptional Situation in Regard to Consumption. Substantial Reduction in Stocks

By C. O. Willson

The total demand for all oils in United States in 1931 was 95.2 per cent of the total for the previous year and 93.1 per cent of the 1929 total which was the largest in the history of the petroleum industry.

The total demand for gasolines in 1931 (domestic consumption plus exports) was 97.6 per cent of the 1930 all-time peak.

The total demand for kerosene, lubricating and petroleum wax in 1931 ranged from 86 to 94 per cent of the totals for the previous year but stocks due to a decreased output were substantially lower at the close of the year, the reductions ranging from 13 to 22.5 per cent.

There was a consistent decline in crude oil stocks throughout the greater part of 1931, the only important addition being in December, and at the close of 1931 the crude oil inventories were over 80,000,000 bbls. less than the peak of 545,186,000 bbls. on October 31, 1929. The total stocks of all oils at the end of 1931 were 78,697,000 bbls. under the peak of 700,681,000 bbls. reported May 31, 1930.

The foregoing are some of the high points gleaned from the preliminary report of the Bureau of Mines of the Department of Commerce covering operations of the producing and refining branches of the oil industry, including the manufacture of natural gasoline. The accompanying table summarizes the report covering supply, demand and stocks with the exception of fuel oil and gas oil. The government report does not give complete data on the production of fuel oil and gas oil so that accurate comparisons with previous years are impossible.

The fact that the total demand for the oil industry's products in United States was better than the 93 per cent of the 1929 peak was not duplicated by any other major industries where a demand of from 25 to 75 per cent of the peak was the rule. The remarkable record of the oil business during a year of severe depression shows the consumer acceptance of the industry's products and reflects the fact that the consumption has passed from the luxury class, ranking next to foods as necessities.

Year of Curtailment

The government data show that throughout the year both producers and refiners of crude oil attempted to keep the supply in line with the demand and when considered for the entire year their efforts were successful. Producers of crude oil started the year with 512,797,000 bbls. of crude oil in storage and ended with 464,504,000 bbls., a decrease of 48,293,000 bbls. Both figures include California residual fuel oils.

This was brought about by a decrease of 47,736,000 bbls. in domestic production and a decrease of 14,879,000 bbls. in crude oil imports or a total reduction of 62,615,000 bbls. in the crude oil supply for 1931 compared with 1930.

Refiners followed this lead of the crude oil producers in part by reducing their crude oil runs to stills 33,825,000 bbls. in 1931 compared to 1930, of which 19,930,000 bbls. was domestic crude oil and 8,744,000 bbls. was foreign crude. No doubt it would have been better for the refining branch if the reduction in refinery operations had absorbed the entire 62,000,000-bbl. decrease in crude oil supply.

This is particularly true in the case of gasolines. Despite the reduction of 3.6 per cent in crude oil runs to stills and a decrease of 16.9 per cent in natural gasoline production, the domestic production of motor fuel in 1931 was practically the same as in 1930, the decrease being approximately one-half of 1 per cent. A decrease of 19.5 per cent in gasoline imports brought the total decrease in motor fuel supply to 1.3 per cent.

The failure of the domestic motor fuel production to show a decrease comparable to the reduction in crude oil runs to stills is of course due to the expansion in cracking facilities at refineries, which was responsible for the increase in gasoline recovery from 46.6 per cent in 1930 to 48.3 per cent in 1931. These yields include the natural gasoline purchased by refiners from manufacturers for blending purposes.

Had it not been for the demand for higher antiknock gasolines, it is improbable that 1931 would have shown very little if any decrease in the production of cracked gasoline. However, despite unfavorable tank car markets at their plants most refiners found it necessary to increase their output of cracked gasoline in order to maintain their competitive position in service station sales. Due to this condition, the increase in cracked gasoline production from 164,243,000 bbls. in 1930 to 176,181,000 bbls. in 1931 more than offset the decline in straight-run and natural gasoline production.

For the entire year based on government figures the total supply of motor fuel in United States as shown in the accompanying table was slightly greater than the total demand and stocks were 4.4 per cent greater at the end of the year than at the start. The data on motor fuel include a small quantity of benzol and all natural gasoline output as well as refinery production of gasolines.

Reduced Inventories

The reduced crude runs to stills, how-

(Continued on Page 90)

CRUDE OIL AND REFINERY SITUATION SUMMARIZED—1931-1930

SUPPLY AND DEMAND—CRUDE OIL (Bbls.)

	Total supply	Total demand*	Excess Demand	Excess Pct.	Domestic production	Imports	Domestic demand*	Exports	Stocks December 31
1931	897,525,000	945,251,000	47,726,000	5.3	850,275,000	47,250,000	919,705,000	25,546,000	464,504,000
1930	960,140,000	988,761,000	28,621,000	2.9	898,011,000	62,129,000	965,056,000	23,705,000	512,230,000
Decrease	62,615,000	43,510,000	.....	...	47,736,000	14,879,000	45,351,000	†1,841,000	47,726,000
Decrease	6.5%	4.4%	.....	...	5.3%	23.8%	4.7%	†7.7%	9.3%

*Derived from government data for comparative purposes. Includes some California residual fuel oil. †Increase.

SUPPLY AND DEMAND—REFINERY PRODUCTS—MOTOR FUEL (Bbls.)

	Total supply	Total demand*	Excess Demand	Excess Pct.	Domestic production	Imports	Domestic demand*	Exports	Stocks December 31
1931	451,509,000	449,145,000	*2,364,000	*.4	437,888,000	13,621,000	403,313,000	45,832,000	42,320,000
1930	457,655,000	460,375,000	2,720,000	.5	440,728,000	16,927,000	394,800,000	65,575,000	40,541,000
Decrease	6,146,000	11,230,000	.....	...	2,840,000	3,306,000	†8,513,000	19,743,000	†1,779,000
Decrease	1.3%	2.4%	.....	...	.6%	19.5%	†2.2%	30.1%	†4.4%
KEROSENE									
1931	42,456,000	44,007,000	1,551,000	3.5	42,446,000	10,000	31,301,000	12,706,000	5,332,000
1930	49,408,000	51,620,000	2,212,000	4.3	49,208,000	200,000	34,736,000	16,884,000	6,883,000
Decrease	6,952,000	7,613,000	.....	...	6,762,000	190,000	3,435,000	4,178,000	1,551,000
Decrease	14%	14%	.....	...	13.7%	95%	9.9%	24.7%	22.5%
LURICATING OIL									
1931	26,735,000	28,195,000	1,460,000	5.1	26,704,000	31,000	20,065,000	8,130,000	9,511,000
1930	34,226,000	31,524,000	*2,702,000	*7.8	34,201,000	25,000	21,589,000	9,935,000	10,971,000
Decrease	7,491,000	3,329,000	.....	...	7,497,000	*6,000	1,524,000	1,805,000	1,460,000
Decrease	22.4%	10.5%	.....	...	21.9%	*24%	7.1%	18.2%	13.3%
PETROLEUM WAX (Lbs.)									
1931	514,484,000	566,233,000	51,749,000	9.1	477,400,000	37,084,000	275,707,000	290,526,000	180,843,000
1930	578,082,000	535,082,000	*43,000,000	*8	547,680,000	30,402,000	242,109,000	292,973,000	232,592,000
Decrease	63,598,000	†31,151,000	.....	...	70,280,000	*6,682,000	*33,598,000	2,447,000	51,749,000
Decrease	11%	†5.8%	.....	...	12.8%	*22%	*13.9%	.8%	22.2%

*Excess supply. †Increase. Note—Total supply equals domestic production plus imports. Total demand equals domestic demand plus exports. Data on demand for refined products are based on refinery shipments.

CRUDE OIL RUNS TO STILLS AND TOTAL ALL OILS (Bbls.)

	Total crude to stills	Domestic crude to stills	Foreign crude to stills	Nat. gasoline production	Gaso. recovery crude oil‡	Total supply all oils*	Total demand all oils*	Stocks all oils December 31
1931	893,622,000	846,685,000	46,937,000	42,966,000	48.3%	981,252,000	1,027,739,000	621,984,000
1930	927,447,000	866,615,000	60,832,000	51,710,000	46.6%	1,056,305,000	1,079,601,000	688,471,000
Decrease	33,825,000	19,930,000	13,895,000	8,744,000	†1.7%	75,053,000	51,862,000	46,487,000
Decrease	3.6%	2.3%	22.8%	16.9%	.....	7.1%	4.8%	6.9%

*Total all oils includes crude oil, refined products, natural gasoline and benzol. †Increase. ‡Includes natural gasolines blended at refineries.
Note—All data based on Bureau of Mines' latest reports. Complete and comparable data on fuel oil and gas oil not available.

Data on Flow of Rotary Drilling Mud

Series of Experiments Indicate Relationship Between Various Characteristics of Plastic Solids Used in Oil Fields

By H. N. Herrick
Engineer, Research and Development Department, Standard Oil Co. of California*

The flow characteristics of drilling muds, as described in this paper, and the method given for solving problems relating to the flow of these muds through pipe and accessory equipment, are based on a conception that drilling muds are plastic solids like paints or greases; not liquids. The data presented in this report have been obtained from studies of California muds, chiefly those used in the Kettleman Hills Fields, by the producing department of the Standard Oil Co. of California.

Although no claim of scientific exactness is made for the formulas and diagrams, since the data upon which they are based are not complete even for California muds, the method has proved to be a convenient means for estimating, closely enough for practical purposes, the pressures required to force muds at various rates through pipe systems in which they are handled. Certain approximations have been made to simplify the procedures so that they can be used easily in the field.

Viscosity and Shearing Strength

For the purpose of this discussion a plastic solid is defined as a material in which no deformation or flow takes place when the material is subjected to shearing forces, until the shearing force reaches a value called the "yield point." With liquids, the smallest force will produce continuous deformation; that is, the yield point of liquids is zero. The difference between true liquids and muds is illustrated in Figure 1, which shows rates of flow through a small tube under different pressures. The flow rates of the liquids is directly proportional to the pressure and that of the muds is not. The behavior of drilling mud does not conform in every detail with the definition of a plastic solid as given, because mud actually flows slightly at pressures below its yield point. However, for practical purposes the definition describes the condition adequately and has the advantage of simplicity.

In order to make mud flow calculations based on the theory that mud is a plastic solid, it is necessary to know the "yield point" of the mud, which hereinafter is defined by Equation 1 under the caption "Viscosity Measurements," and is "viscosity" as defined by Equation 2. The term "yield point" and "viscosity" used in this paper should be understood to be the values so defined, without regard to the strict meaning of these terms as used by physicists.

To apply these values to mud flow problems, the pressure loss is computed as a constant amount independent of the flow rate required to overcome the shearing strength of the mud, plus an amount depending upon the flow rate and viscosity, as for true liquids. This is a purely empirical assumption, suggested by the shape of the pressure quantity curves resulting from viscosity tests of mud.

Owing to the lack of proportionality between pressure and flow rate, a single test in an ordinary viscosimeter will not give satisfactory results for mud. As an illustration, the apparent viscosity of a sample of Kettleman Hills drilling mud weighing 75.6 pounds per cubic foot, determined on a Stormer viscosimeter using different actuating weights, was as follows:

Actuating weight, grams	Apparent viscosity, centipoises
139.96	53
89.96	103

The smallest weight used with the instrument would not move it, which makes the apparent viscosity of the mud infinite; in other words, the shearing force supplied by the small weight was less than the yield value of the mud. Actually, the viscosity of this mud was only 8 centipoises, and its yield point was 0.2 pound per square foot. The fact that special methods are required to determine the viscosity of any suspension of a solid in a liquid cannot be emphasized too strongly. This fact is well known to paint and grease chemists, but often is overlooked in oil field work.

*Before A.I.M.E., New York, February, 1932.

Viscosity Measurement

Some type of viscosimeter must be used in which several determinations can be made at different rates of flow. A simple apparatus adapted for use with mud is a modified "pressure viscosimeter" such as is used in testing greases, but any convenient arrangement whereby a series of determinations can be made of the rate of efflux of the mud through a small tube of known dimensions under different pressures between 2 and 20 inches of water may be used. The diameter of the efflux tube should not be over 0.05 inch, and must be measured accurately, since the fourth power of the diameter is used in the formula for determining viscosity. The hole should be reamed or lapped smooth to size.

To use this viscosimeter, a sample of mud is put through a 40-mesh screen to remove grains that might plug the efflux tube, and a series of determinations is made of the rate of discharge in grams per 100 seconds under different pressures. These results are plotted as shown in Figure 1, using flow in grams per 100 seconds as ordinates and pressure in inches of water as abscissas. A straight line is then drawn through the plotted point as nearly as possible. Constants of the instrument should be checked with a liquid of known viscosity, such as 40 per cent sugar solution, viscosity 6.5 centipoises at 65° F.

The intercept of this line on the pressure axis is the "yield point pressure," h.

The yield point and "viscosity" of the mud are then computed by means of the following formulas:

$$(1) \qquad F = 1.3\frac{D}{L} - h$$

$$(2) \qquad V = \frac{100{,}000D^4}{LQ}(H - h)$$

where for any point on the line:

Q = grams discharged per second,
D = diameter of efflux tube, inches (exact),
L = length of efflux tube, inches,
V = absolute viscosity, centipoises,
H = pressure, inches of water, corresponding to rate Q,
h = "yield point pressure," inches of water (at point where line cuts pressure axis),
F = "yield point" (shearing strength of mud), pounds per square foot.

These formulas are an adaptation from the work of Hatschek wherein the English and metric units have been used in the present work as most convenient under the local conditions.

The diagram, Figure 1, shows typical results on three samples of mud, with two liquids similarly plotted to illustrate the difference in physical properties between liquids and plastic solids. The viscosity is indicated by the slope of the lines, and it is evident that the viscosity of muds does not vary greatly, although there is wide variation in their shearing strengths. The reason for the erratic results with different weights on the Stormer viscosimeter will be clear when it is considered that such determinations are equivalent to drawing lines from the origin to different points on the line representing test results. The slopes (viscosities) of the two lines so drawn will have no physical meaning, and cannot check each other.

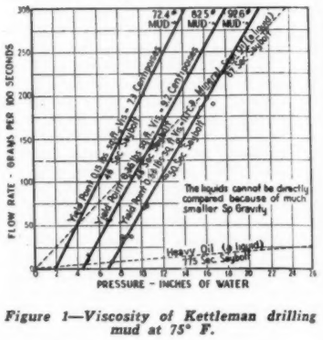

FLOW RATE - GRAMS PER 100 SECONDS
PRESSURE - INCHES OF WATER
72.4# MUD
82.5# MUD
98.6# MUD
The liquids cannot be directly compared because of much smaller Sp Gravity
Heavy Oil (a liquid)
175 Sec. Saybolt

Figure 1—Viscosity of Kettleman drilling mud at 75° F.

For the muds tested in California, the "yield point" F in pounds per square foot is approximately:

$$F = 0.02[(\text{weight of mud, pounds per cubic foot}) - 65]$$

This relation does not apply to muds lighter than 67 pounds or heavier than 100 pounds per cubic foot, or to muds that have had special chemical treatment.

Temperature variation within ordinary limits does not have much effect on yield points.

The viscosity varies between 7 centipoises for mud weighing 70 pounds per cubic foot and 11 centipoises for 90-pound mud. It decreases very rapidly for material weighing less than 70 pounds per cubic foot, but such material hardly would be considered drilling mud.

Flow of Mud in Pipe

A full mathematical description of the flow of plastic solids is given by Bingham. For our purpose, it is sufficient to assume that the pressure required to start and maintain shear in a pipe filled with a plastic solid is: "yield point pressure" (h) in pounds per square inch = $0.333F\frac{L}{D}$ in which

F = "yield point" of the plastic solid, pounds per square foot, from viscosimeter test curves,
L = length of line, feet,
D = diameter of line, inches.

This pressure does not vary with the flow rate, but is simply the pressure that is required to overcome the shearing strength of the mud. To find the total pressure required to maintain any given rate of flow the lost head due to friction, calculated from the viscosity and flow rate, and the static pressure due to any difference of elevation between the ends of the line must be added to the "yield point pressure."

The following empirical formulas describe the flow of California muds of various densities through pipe lines. They will be recognized as adaptations of Williams and Hazen's formula for the flow of water, modified to take account of

(Continued on Page 90)

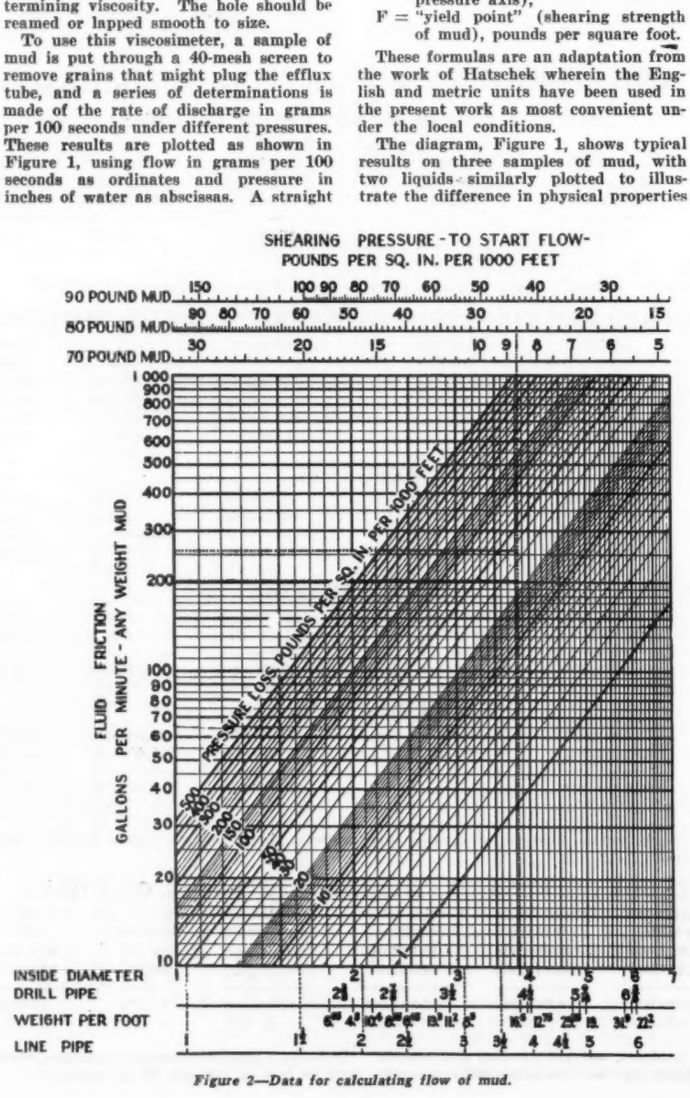

SHEARING PRESSURE-TO START FLOW-POUNDS PER SQ. IN. PER 1000 FEET
90 POUND MUD
80 POUND MUD
70 POUND MUD
FLUID FRICTION GALLONS PER MINUTE - ANY WEIGHT MUD
PRESSURE LOSS POUNDS PER SQ. IN. PER 1000 FEET
INSIDE DIAMETER DRILL PIPE
WEIGHT PER FOOT LINE PIPE

Figure 2—Data for calculating flow of mud.

The Economics of Domestic Marketing

Margins on Gasoline and Oil Said Likely to Decline Further as More Economical Methods Supersede the Present

By Sidney A. Swensrud
Assistant to the President, Standard Oil Co. of Ohio*

About a year ago, I attempted in a general way to trace the origin and development of some of the marketing problems of the petroleum industry, and to describe certain trends which it then seemed possible to foresee. To summarize briefly, it was pointed out that the consumption of gasoline, after increasing for more than a decade at an almost unbelievable rate, was slowing down, but that the two factors which determined the supply of gasoline—namely, the production of crude oil and the percentage of gasoline derived therefrom—were tending steadily to mount. It was suggested that, while the increase in gasoline outlets began with and probably was justified at the start by the rapidly increasing demand, long after all reasonable requirements as to number of outlets had been met the number continued to increase—if anything, at a still more rapid rate—because by that time the overproduction of crude had begun to exert an impelling urge upon the owners of that crude to seek assured outlets for it in the form of gasoline. As more and more companies became integrated all the way from crude oil to marketing, there took place an ever-increasing competition among them, not only for the existing outlets but for new ones.

The wide margin between wholesale cost and retail price, which is characteristic of the early stages of most new industries, persisted in the oil industry longer than in most industries, for various reasons. The existence of that wide margin provided in large measure the means of attracting new outlets, for as the gallonage per outlet declined with the increasing number of outlets, competing companies simply offered the dealers a larger part of the total margin. The very nature of competition suggests that such a process would continue until practically all of the available margin was thus given away, and such was clearly the tendency. It was a system that in turn produced increasing marketing expense per gallon on account of the diluted gallonage per outlet; this increased expense might seem to have provided a justification for continuing wide margins. Economics, like its parent, nature, however, progresses by mutations and so began to throw out new types of marketers, in the form of tank car service stations, cut-price jobbers, and the like—heretics or messiahs, according to one's view—who challenged the validity of the wide margins and the expensive distribution methods and who said, in effect, "We will give the public lower prices, which we can well afford to do because we have not built up these expensive practices. Our lower prices will bring us greater volume, and if our conventional and respectable competitors try to meet us with reduced prices, they will suffer a loss, because as a whole they cannot greatly increase their volume or reduce their unit expense."

It was in the belief that the methods of this type of marketer constituted a challenge of more than passing significance that I felt justified in saying we probably would see margins continue to narrow. The new type of marketer competes in terms of retail prices rather than in terms of outlets; his cut prices force major companies' dealers to shade their prices and eventually the major companies' own stations must either meet the lower prices or suffer large gallonage losses. Thus are set in motion forces which reduce the total margin between wholesale cost and retail price. They do not necessarily result, however, immediately in lowering that part of the total margin which is given to the dealer as his commission, for the competition among companies for his patronage tends to postpone such reductions until finally they are forced by the logic of events.

If this summary seems over long, it must be excused on the ground that it may be helpful in appraising the events of 1931. I think it is no exaggeration to say that 1931 has been the most eventful year to date in the oil industry from the standpoint of economic change. It will be my purpose to discuss some of these events—a mere narration of them might of itself be interesting, but I should like rather to see whether out of them we can discern any significant tendencies or trends, and whether they contain any lessons of value.

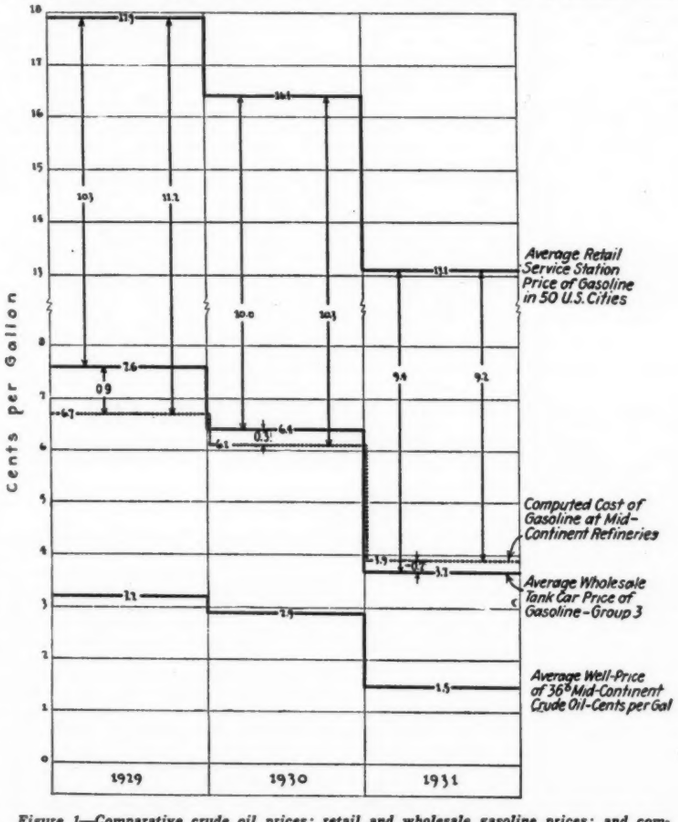

Cents per Gallon
Average Retail Service Station Price of Gasoline in 50 U.S. Cities
Computed Cost of Gasoline at Mid-Continent Refineries
Average Wholesale Tank Car Price of Gasoline - Group 3
Average Well-Price of 36° Mid-Continent Crude Oil - Cents per Gal
1929
1930
1931

Figure 1—Comparative crude oil prices; retail and wholesale gasoline prices; and computed refinery cost of gasoline from 1929 to 1931.

General Trend of Prices

Let us glance first, objectively, at the general trend of prices, which may be seen from Figure 1. To anyone even approximately familiar with the events of the past few years, this picture of prices will be recognized as the chronology of constantly increasing potential production of crude oil climaxed in 1931 by the opening of the now famous East Texas Field.

It is hardly necessary to dwell on the effect of 1931 price levels on the average crude producer. It has been said that rarely are all departments of the oil business enjoying or suffering an equal degree of profitableness or unprofitableness (except, of course, the pipe lines, which are alleged to be always profitable!). Certainly the production department must have suffered most in 1931. How, then, has it fared with the refining and marketing ends? These departments live in the zone between the prices of crude oil and of finished products, and their prosperity depends largely on the width of that zone.

The lowest line in Figure 1 shows the average posted well price in the Mid-Continent Field of 36 gravity crude oil for each of the three years. In the next unbroken line above is shown the computed refinery cost of gasoline at Mid-Continent refineries. These gasoline cost figures have been computed by taking the average well price of 100 gallons of crude oil, adding an arbitrary $1 per 100 gallons for the cost of getting the crude to the refineries and of processing it there, and from this total deducting the computed value of the by-products—that is, all products other than gasoline. These by-product values were arrived at by taking the average yield of each product per 100 gallons of crude for all refineries in the United States, as reported by the U. S. Bureau of Mines, and applying thereto the average Mid-Continent price quotations for each product, as taken from the trade journals. The total cost less the aggregate value of the by-products is then assumed to be the cost of the finished gasoline produced. The yield of gasoline was also taken from the Bureau of Mines reports, and of course rose considerably during the three years. Dividing the net cost of the gasoline produced by the number of gasoline gallons gives the computed cost per gallon of gasoline. If anyone should desire to see exactly how the computations were worked out, I shall be glad to send them copies of the detailed figures.

It is obvious, of course, that the gasoline cost figures as thus determined for any one year are, at best, rough approximations, but it is believed that so far as measuring the differences between the several years is concerned, they are sufficiently accurate for our purpose.

The broken line shows the average wholesale tank car price in each year of U. S. Motor gasoline in Group 3 (that is, the Mid-Continent area). The top line shows the average posted service station price, less tax, of ordinary motor gasoline in 50 representative cities in the United States. This is taken from the monthly price index published by The Oil and Gas Journal, and while somewhat unsatisfactory because, being for the entire country, it obviously is several cents per gallon higher than retail prices in the Mid-Continent area normally would be, it is the best index of retail gasoline prices within my knowledge, and is believed to measure very satisfactorily the factor in which we are particularly interested here; namely, the differences in retail prices from one year to another.

From this chart we may observe that in 1929 the wholesale price of gasoline appears to have been about 0.9 cent per gallon above the indicated refinery cost; in 1930, this margin of refinery profit has shrunk to 0.3 cent per gallon; and in 1931, it has not only evaporated entirely but has become less than nothing, since the wholesale price was less than the indicated refinery cost by about 0.2 cent per gallon.

Retail Selling

There is another margin worth examining, for the average refiner does not sell entirely at wholesale, but in the retail market as well; therefore, he is concerned also with the margin between refinery costs and retail prices. In 1929, the difference between the refinery cost of gasoline in the Mid-Continent and the average posted service station price in the United States was 11.2 cents per gallon; in 1930, it fell to 10.3 cents; and in 1931, to 9.2 cents. The average refiner selling at retail, therefore, apparently suffered a reduction in his effective margin from 1929 to 1931 of 2 cents per gallon. This is quite a chunk to take off the few cents which ever can remain as profit. It is like the traditional inch off the end of one's nose—not much in relation to one's total height, but a great deal in proportion to the nose.

Then there is also the marketer or jobber who has no refinery but buys in the wholesale tank car market. What about his margin? In 1929, the average retail service station price throughout the United States was 10.3 cents per gallon above the average Group 3 tank car price; in 1930, this margin was 10 cents; and in 1931, 9.4 cents. He therefore has fared somewhat better than the refiner, having had only about 1 cent per gallon chopped off his margin from 1929 to 1931.

The gasoline prices used are based on ordinary motor gasoline. If the premium grades and the third grade were taken into consideration, the reductions in margin would look somewhat worse, for certainly between 1930 and 1931 there was in many sections of the country a material decline in the proportion of gasoline sold at a premium price owing to the improved antiknock quality of "regular" gasoline, and an increase in the proportion of gasoline sold below the so-called "regular" price on account of the policy widely adopted among major companies in 1931 of marketing a third grade of gasoline. Both of these factors would have the result of degrading the average retail price of all gasoline sold at retail more than is reflected merely by the decline in the price of ordinary motor gaso-

(Continued on Page 91)

*Before A.I.M.E., New York, February, 1932. Printed without author's corrections. Subject to revision.

Amos L. Beaty Favors Statutory Control

Says Industry Can Prosper Only If Crude Production Is Not Excessive. Restraint Would Benefit Whole Industry

By Amos L. Beaty
President American Petroleum Institute*

The oil industry can prosper only if crude production is not excessive. This is true for several reasons.

In the first place the marketing branch of the business is so highly competitive that there is little room for profits in it. There are too many service stations, too many middle men or jobbers, too many refiners eager to press their products upon the market. And the battle is between the strong. If any money is being made in oil today it is by small marketers who buy products from the refining companies and sell on guaranteed margins.

In the second place refineries are overbuilt. There is a large surplus refining capacity. If refined stocks were drawn down they could and would be replenished in short time on short notice. This excessive refining capacity is not serious, however, if the supply of crude is limited to trade requirements. True, it may reflect upon the intelligence of the industry, but if there were a shortage of crude for a few years refining capacities would be readjusted. In the meantime no great harm could result from some idle capacity. It requires no computation to see that refiners could not produce surplus stocks of products from a short supply of crude. I have in mind, of course, the increased yields from cracking. Allowance must be made for that. Still, the picture is the same; less crude is required.

I think we can have prosperity in the oil business if too much crude is not produced. A proper limit at this point would be felt all the way down the line. It would slow the refiner and slow the marketer inevitably. Once this constant pressure to make more and sell more is off, operations will be normal and there will be some return on investments.

Producing Below Cost

Potential production at this time is very large, and this condition has existed for many months. As a result the price of crude is low. It is below the average cost of production. Nevertheless, if restraints were withdrawn actual production would immediately increase and the situation would become even worse than it is now. Eventually, of course, the law of supply and demand will work a cure. When too much oil is produced and offered on the market the price declines. Lower and lower prices finally affect drilling and this in turn reduces production. This factor is already at work and has been for a year or more. Millions of acres of land held under lease have been surrendered and thousands of stripper wells have been abandoned. At the same time, artificial restraints upon production have to some extent broken the force of the downward price pressure. Nevertheless, the continuing fear that these restraints will cease has had a depressing effect despite the fact that there have been substantial drafts on storage. It is perfectly plain, I think, that the present low prices of crude, coupled with the possibility of even lower prices, would eventually eliminate the oversupply element. But the coincidence at this time of several enormous pools would result in a very severe ordeal to the industry if the pools were unrestrained. On the other hand, with the probability of new pools eliminated or reduced, due to the slowing down of wildcat operations, and with the draft of nearly a billion barrels annually upon the pools now producing, it would take only a few years at most to convert the present oversupply into a shortage. Yes, unrestrained production for a while would be a remedy for the ills of the oil industry, but it would be terrible in its severity and not many of the companies now in business would survive.

Favors Governmental Co-operation

There is one school in the industry which firmly believes that this is the best thing after all. But, expressing only my own personal views, I cannot accept that theory, and I believe the industry is well set against it. I believe not only in the curtailment of production by voluntary action of the industry, but in curtailment by statutory enactments, in which commissions and umpires administer the law, see that all producers alike curtail their operations and that one pool is not discriminated against in favor of another.

The folly of taking oil from the earth too rapidly at the loss of propulsive energy is no greater than the folly of vacating the tankage that nature made and substituting expensive steel, and these follies combined do not compare with the idiocy of states that see their natural resources depleted without adequate return.

Our case is different from others. It is different not only on the theory that oil reserves are exhaustible. There is difference based on the nature of producing operation. An oversupply of cotton, wheat, pork or hides cannot be ascertained until after it has occurred and the damage done. In the production of cotton, wheat and other farm products acreage is not a controlling factor in forecasts. Without question oil production can be limited currently to consumption or market demand. It needs only legislation against economic waste, or, in other words, law which prohibits production in excess of consumption or market demand. This is government control, but we need this kind of control. Time and time again we have seen the inadequacy of self control. We need a system of state laws, effective in the oil producing states, under which not only physical waste of oil and gas and the waste of propulsive energy, but economic waste of these valuable products, can be prevented. Oklahoma and Kansas already have laws of that kind. California is in the process of such enactment, and there is good ground for the belief that Texas will not continue to lag behind.

Evolution of Curtailment

The development of this idea of restraint by law against excessive crude oil production has been most interesting First we had voluntary restraint. As this in some cases became ineffectual, due largely to the greed of minorities, restraint by law was evolved. It is making rapid progress and, I do not hesitate to predict, will soon become the bulwark of our industry in times like the present.

Economic waste is seen in various industries. In this machine age, when overproduction presents such serious problems in many lines, it would not be surprising to see various industries advocating this kind of legislation. It may not be practical in all industries, but in a natural resource industry, and especially in ours where nine times out of ten economic waste and physical waste go hand in hand, there can be no sound objection. When economic waste is prevented there is simultaneous prevention of physical waste and conservation of reserve energy, which differentiates our case from even that of other natural resource industries. We are in a position of vantage and should lead. We can help ourselves and at the same time help the whole country and the world at large. In my opinion few things would inspire more confidence or more decisively initiate a return to prosperity than for the production of oil in the United States to be limited by effective law to market demand.

Reserves a Valuable Asset

Instead of being a liability our proven reserves are a wonderful asset if properly husbanded. They should give stability rather than instability to the industry. The old fear of oil petering out is no longer present. Stocks in the ground are better than stocks in steel.

Doubting Thomases have pointed to the difficulty of maintaining an equitable balance between states and also between pools. But these difficulties are slight in comparison with the importance of the principle involved. True, the administration in one state, whether acting upon its own views or reflecting the opinion of the industry in that state, may claim too much of the market. True, public officials may not possess the high order of understanding which is desirable. But, after all, it only requires a reasonable amount of fairness and intelligence to bring satisfactory results. We are witnessing at this time the workings of the system. Texas, it is true, has not the kind of law that is required, but due to threatened insurrection resulting from demoralization in oil production the governor of the state has proclaimed and is maintaining martial law. Under martial law oil production in East Texas is being held down to a basis which precludes the waste of reservoir energy, and incidentally to market demand. There may be inequalities as between the states. California may be producing too much or Oklahoma too little. There may be inequalities between the pools. East Texas may be producing too much and Oklahoma City too little. But in the last analysis the result is not bad. The market is not flooded with distress oil. the price is not down to 10 cents a barrel, and the states and pools which have been pinched too much will have their oil when we return to normal conditions and prices are sufficient to cover the cost of production.

The importance of our $12,000,000,000 industry, with 2,000,000 investors, 2,500,000 workers, and which, including the income taxes of its investors in normal times, pays nearly $1,000,000,000 annually in taxes, is hard to overestimate. Naturally one shudders at the thought of this structure being wrecked. And I am not thinking so much of millionaires, if any, as I am of the workers and people of moderate means who have invested their savings in good faith. The latter have invested largely in the smaller companies. They would be the sufferers in a wreck. If they were not involved one might be tempted to say, let nature take its course, let oil go as freely as water until all drilling is stopped and known pools are exhausted, after which the business will be on a sound basis. But that would be both heartless and wasteful. Moreover, we would then see the other extreme, scarcity and high prices, in a new cycle which might be as bad as the oil. No, we must go forward and not slide back.

*Address before New York meeting of the A.I.M.E.

INFLUENCE OF PRORATION ON RECENT COURSE OF INDUSTRY

By Joseph E. Pogue
Consulting Engineer, New York*

To appreciate the causes that brought proration in the petroleum industry into being, it is necessary to view briefly the development of the industry over the past 20 years, approximately the span of the gasoline era. For the first 10 years of the period, the industry was seeking capital to effect the tremendous growth made necessary by the rise of automotive transportation and the industrial growth of the country. This, of course, was a very profitable period. It had to be profitable, for in no other manner could the requisite growth be accomplished. The second decade of this period, however, brought a change; it became no longer necessary to attract capital. On the contrary, the petroleum industry had won such a favorable reputation as a field for profitable enterprise that capital began to seek the industry in ever increasing volume, and profits were no longer essential. Thus the industry made a transition from a condition of undercapitalization to one of overcapitalization. The turning point was approximately in 1922. For a time thereafter the effects of progressive overcapitalization were minimized and masked by the continuation of an extraordinary growth in consumption, but the seeds of overcapacity were sown and the crop was germinating. Oil began to be discovered more rapidly, radical improvements in technology took place, and by the midpoint of this second period, in 1927, the supply of oil ran ahead of demand plus the speculative desire to store, and a basic down-trend in oil prices was established.

If this trend had been free to manifest itself, the capital inflow and hence the productive enterprise of the industry would have been retarded, but events did not take that course. The tempo of the times was otherwise. Instead, there developed gradually, almost automatically, the method we now call proration for withholding the supply from the market, which had the effect initially of supporting prices and thus preventing the basic adjustments that otherwise would have taken place.

Proration developed from a simple process of ratably restricting the takings of oil from the leases of a single oil field, directed by voluntary association of producers, to a highly complicated process of allocating demand to states, fields, and leases, under the administration of a range of poorly co-ordinated laws, administrative bodies, and voluntary committees. Certain principles emerged in the process, such as the principle of ratable takings within the single field, the prevailing rule of periodic adjustments to the demands "nominated" by purchasing agencies, and the recognition of the capacity to produce as a guiding procedure. These three grounds of action have become of the utmost im-

(Continued on Page 32)

*Presented at the February meeting of the A.I.M.E. in New York.

A.P.I. REFINERY REPORT

Owing to the holiday the A.P.I. report on refinery operations for the week ending February 20 was not available for publication in this issue.

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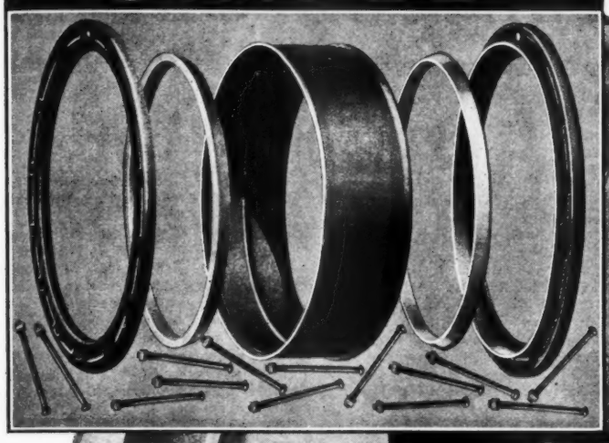

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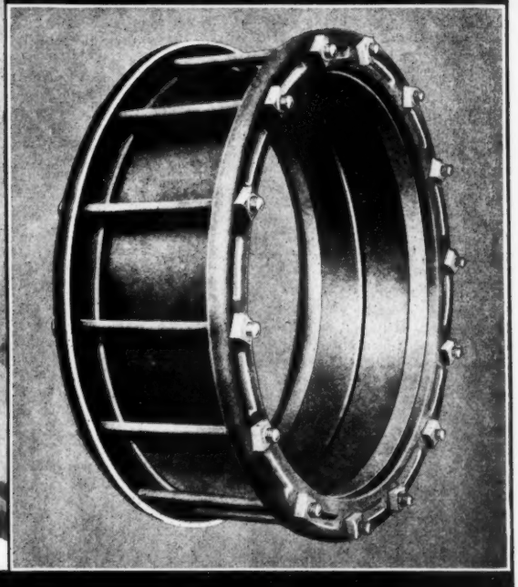

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Experiments on Natural Gas in Oil Sand

Laboratory Investigation Develops Many Interesting Facts Regarding Formation of Gas Bubbles in Reservoir Media

By Ionel I. Gardescu
Geologist and Petroleum Engineer, Oil & Gas Dept., University of Pittsburgh*

In connection with some of the experiments carried out by the writer on the behavior of gas and oil in a sand reservoir, an interesting phenomenon was observed which may throw some new light on the problem of recovery of oil from a natural reservoir. The experiments are intended to show the effect of the surface area of the occluded gas masses, originally present in a reservoir, on the further evolution of gas from the oil and its consequent effect upon the rate of production of oil.

The apparatus used in the experimental work consists primarily of a sand reservoir and a displacement chamber, which is used to induce small variations in volume. The reservoir and displacement chamber form a unit, and a lowering of the plunger is equivalent to increasing the volume occupied by the oil and gas in the reservoir.

The reservoir was first filled with dead oil and maintained under pressure until it was ascertained that most of the free gas had gone into solution. The volume of free gas present in the reservoir was computed from the coefficient of compressibility of the fluids by means of the displacement chamber, reading to 0.005 cc. and a special gauge reading to 0.02 pound per square inch. The oil was saturated with gas under pressure in the reservoir by circulating the oil for a long period of time through the gear pump.

In the following experiments the sand reservoir was filled with gas-saturated oil at a pressure of 415 pounds per square inch with no free gas present. This was ascertained by closing off all the outlet valves and determining the coefficient of compressibility of the system by means of the displacement chamber.

Much difficulty was encountered in eliminating all of the free gas masses from the oil reservoir. The dead oil originally present in the reservoir was subjected repeatedly to great variations in pressure, ranging from vacuum conditions to 2,000 pounds per square inch, and these operations were extended over a period of several weeks until all of the free gas was either eliminated or absorbd by the oil.

Experiment 1

After the reservoir was filled with oil saturated with gas at 415 pounds per square inch, the plunger was lowered, thereby increasing the volume of the reservoir and consequently lowering its pressure. An increase of volume of the oil of 1.8 c.c. caused a drop of pressure from 415 to 300 pounds per square inch. Without any further change in volume, the pressure seemed to remain stationary at 300 pounds per square inch. An increase in volume of 1.8 c.c. represented approximately the compressibility of the oil in the reservoir from 300 to 415 pounds per square inch in pressure and the reservoir acted as if it were filled with dead oil.

All pressures referred to in these experiments are reservoir pressures, which are uniform throughout the reservoir because of the very low rates of flow involved.

Several determinations were made with the oil in the reservoir completely saturated at 415 pounds per square inch pressure. Further experiments will show that the reason that gas did not come out of solution was the absence originally of any free gas in the reservoir; not a deficiency of saturation. In other words, at 300 pounds per square inch the oil was present in the reservoir in a condition of supersaturation and was holding more than 27 per cent excess gas in solution above saturation.

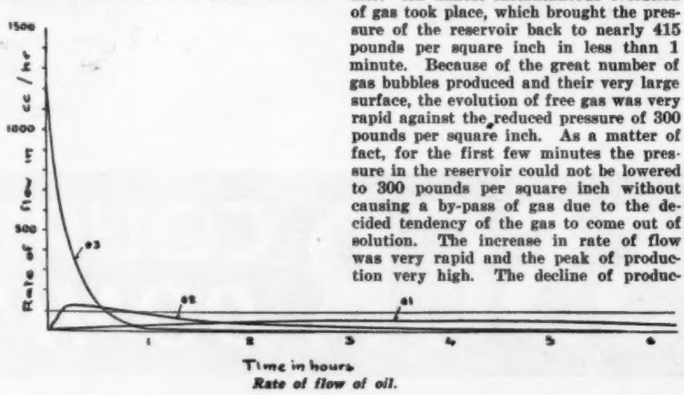
*Before A.I.M.E., New York, February, 1931. Published by permission of the research department, Gulf Companies.

The reservoir originally was void of free gas masses, and the only way the gas could come out of solution was by forming gas bubbles. The pressure inside a gas bubble is greater than that of the surrounding oil and is expressed by the relation $2T/R$, where T is the surface tension of the gas-oil interface and R is the radius of the bubble. As the original bubble necessarily is very small when first formed, the excess pressure $2T/R$ is very large. According to Boyle's law the concentration of gas molecules is proportional to the pressure; therefore the concentration of gas molecules inside a small gas bubble also is very large. If the oil in the reservoir at 300 pounds per square inch were brought in contact with a large mass of gas of 300 pounds pressure, undoubtedly the excess gas held in solution by the oil could diffuse readily into the large gas mass; but with the small gas bubbles the excess concentration of gas molecules in the oil is not sufficiently great to compensate for the greater excess of concentration required for the formation of small gas bubbles. However, the value of the excess concentration in the small gas bubbles, equal to $2T/R$, may be reduced by lowering the value of T. This is exactly what occurs, for it is around small solid particles (nuclei) which tend to lower the surface tension of the oil that gas bubbles are able to form. Even under these conditions, the oil has to reach some degree of supersaturation, depending on the nature of the nuclei, before any free gas bubbles can form.

After lowering the pressure in the reservoir from 415 to 300 pounds per square inch, presumably a few gas bubbles did form in the reservoir around a few nuclei, but because of their small size they could not be detected at first.

After a bubble has been formed, gas will continue to diffuse from the oil into the bubble, the rate of diffusion being proportional to the concentration of gas in the surrounding oil and the surface area of the interface along which the diffusion takes place. At first, the gas bubbles are small and their surface is small. Consequently, the rate of diffusion of gas into these bubbles is small, but as the bubbles increase in size, their surface area is increased and therefore the rate of evolution is greater.

In order to maintain the pressure of the reservoir at 300 pounds per square inch, it was necessary to remove some of the oil gradually in order to compensate for the gas evolved in the reservoir, since the total volume of oil and free gas had to remain the same. Therefore the amount of oil removed from the reservoir, while maintaining a constant pressure of 300 pounds per square inch, represents the volume of free gas developed in the reservoir. Flow curve 1 shows the rate of evolution of gas and consequently the rate of recovery of oil from the sand reservoir in experiment 1. The rate of evolution of gas was very small at first and increased gradually for 3½ hours, at which time it reached a maximum of nearly 1 c.c. per minute. After this the rate started to decline because of the exhaustion of gas from the oil surrounding the individual gas masses. During all this time the reservoir pressure was maintained at a constant pressure of 300 pounds per square inch, and the resulting flow of oil was due solely to the displacement of oil by gas bubbles, which resulted from the gradual evolution of gas from the supersaturated oil.



Rate of flow of oil.

The condition of supersaturation was induced by lowering the pressure of the gas-saturated oil from 415 to 300 pounds per square inch. The operation was not accompanied by any sudden evolution of gas because of the lack of gas-oil interface along which the evolution of gas could have taken place.

Experiment 2

After filling the reservoir with oil saturated with gas at 415 pounds per square inch, as in experiment 1, the pressure in the reservoir was lowered to 20 pounds per square inch by lowering the plunger and removing nearly 8 c.c. of oil from the sand reservoir. Without any further change in volume, the pressure in the reservoir started to build up, and within a few minutes the pressure was as high as 300 pounds per square inch and showed a tendency to increase further. At this point more oil was withdrawn through the displacement chamber in order to maintain a constant pressure in the reservoir of 300 pounds per square inch.

The lowering in pressure from 415 to 20 pounds per square inch created a high degree of supersaturation of the oil, and consequently a great number of gas bubbles were developed. Although the total volume of these bubbles was only 8 c.c. their surface was very large, because of their large number, and afforded a high rate of evolution of gas. As these bubbles increased in size the rate of evolution of gas also increased, but the decline started sooner than in the previous experiment and was more rapid because of an earlier exhaustion of gas from the surrounding oil. Flow curve 2 shows the results of this experiment.

Experiment 3

After filling the reservoir with oil saturated with gas at 415 pounds per square inch, the pressure in the reservoir was lowered to 20 pounds per square inch as in experiment 2. However, instead of letting the gas come out of solution and form bubbles around selective nuclei, after the oil was brought to a state of excessive supersaturation the reservoir was mechanically agitated by hitting it with a hammer. An almost instantaneous evolution of gas took place, which brought the pressure of the reservoir back to nearly 415 pounds per square inch in less than 1 minute. Because of the great number of gas bubbles produced and their very large surface, the evolution of free gas was very rapid against the reduced pressure of 300 pounds per square inch. As a matter of fact, for the first few minutes the pressure in the reservoir could not be lowered to 300 pounds per square inch without causing a by-pass of gas due to the decided tendency of the gas to come out of solution. The increase in rate of flow was very rapid and the peak of production very high. The decline of production soon followed because of an early and rapid exhaustion of gas from the reservoir.

Field men have known for a long time that letting a well blow itself in would result in a greater rate of production. There is little doubt that an analogy exists between the blowing in of a well and the type of flow expressed by flow curve 2. The same analogy can be traced between flow represented by curve 3 and the flow of a well following shooting.

The same phenomenon illustrated in the three experiments above can be readily observed by simply removing the cap of a ginger ale bottle. If the cap is removed gently from the bottle, the evolution of gas takes place at a slow rate, but if the bottle is given a brusque shake, gas will be liberated at a high rate throughout the mass of liquid and both ginger ale and CO_2 will flow out of the bottle. If the cap is removed gently, a few gas bubbles are produced, mostly forming along the glass surface at particular points. Gas bubbles do not form at random; a gas bubble once formed begains to grow until its buoyancy is great enough to detach the bubble from the glass and force it to the surface of the liquid and soon after, at that same point, another gas bubble will begin to form, and the repeated evolution of bubbles from that point continues.

The reason the gas bubble forms at a particular point is because of a nucleus which facilitates its formation. If the ginger ale is poured into a glass not perfectly clean, the development of a very large number of gas masses on the surface of the glass may be observed. The writer believes that a similar phenomenon might occur in a reservoir. The oil may contain and generally does contain substances which would act as nuclei for the formation of gas masses. The sand surfaces also may have nuclei adhering to them. It is conceivable that two reservoirs apparently identical as to extent, porosity, oil and gas content, etc., might act very differently because the rate of evolution and the distribution of the gas masses might be different because of the character and distribution of the nuclei in the reservoir. At present no process is known which would alter the nature or distribution of nuclei in a natural reservoir, but it is possible to control the pressures in a reservoir to some extent and thereby create a condition of supersaturation which with the application of shock (shooting with nitroglycerin) might lead to the proper distribution of gas nuclei. The writer believes that a wide distribution of gas masses throughout the reservoir is essential for the efficient utilization of the energy held by the gas in solution. Some of the benefits that may result from a wide distribution of gas bubbles are summarized as follows:

1. Conservation of gas energy by minimizing the by-pass of gas.
2. Higher reservoir pressures because of a reduced degree of supersaturation.
3. Higher rates of flow and better control of flow rates by providing more interface for the release of gas from solution.

To discuss these three points fully is beyond the scope of this paper, the purpose of which is limited to demonstrating one phenomenon; namely, that by creating different distributions of gas masses in an oil sand reservoir it is possible to secure rates of evolution of gas and consequently different rates of production of oil. The differences in distribution of gas masses were accomplished in the experimental work by causing variations in pressures and by the application of shock, both of which may be applied to a natural oil reservoir.

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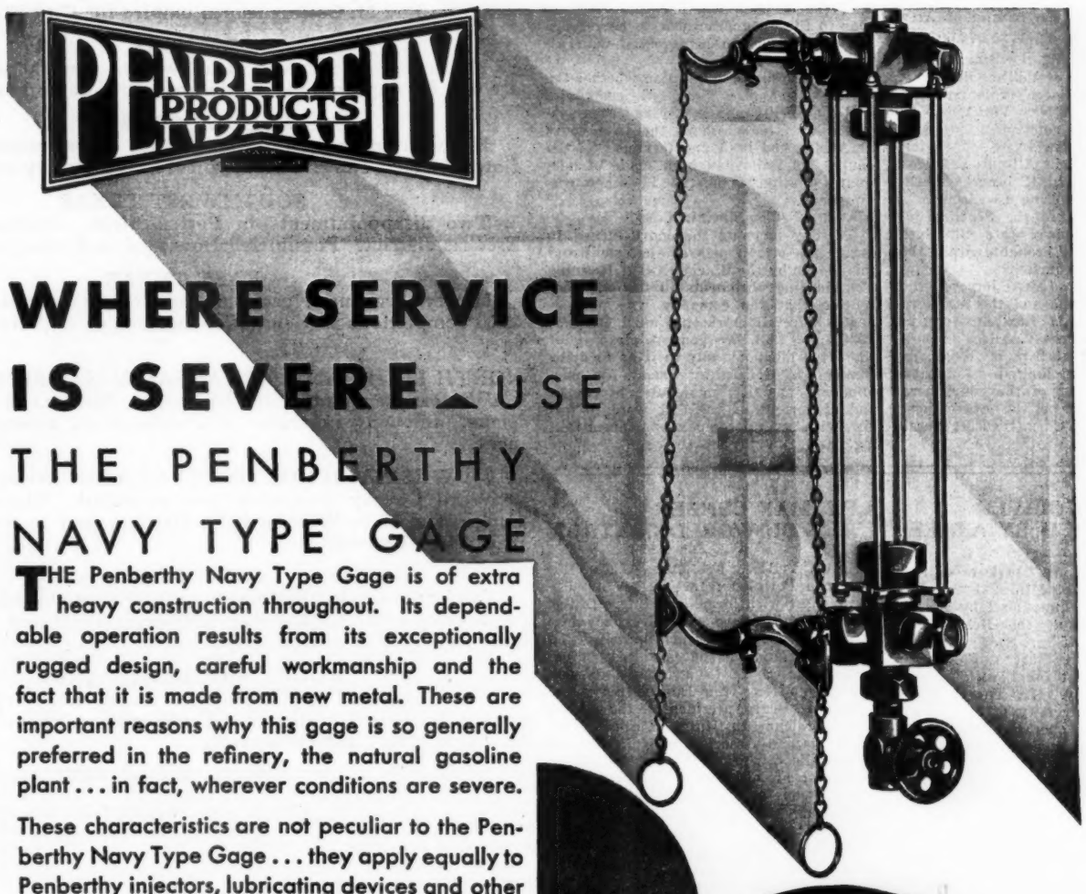
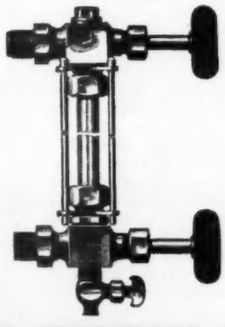




"SURE-DROP" "SENTRY" "SATURN" "SCREW TOP" "SILEX" "SAMSON"

MILLION DOLLAR FINE IMPOSED CONDITIONALLY IN OUSTER CASE

AUSTIN, Tex., Feb. 23.—District Judge J. D. Moore on Tuesday announced that he will grant the motion of Atty. Gen. James V. Allred for $1,074,500 default judgment against the Standard Oil Co. (New Jersey), Standard Oil Co. of California and the Socony-Vacuum Corp. (Standard Oil Co. of New York), subject to the action by the companies by 2 p.m. today as to filing answers, which, so far, have been withheld, in Allred's antitrust suit against these and 12 other oil companies and two marketing associations.

The ruling sustained the State's contention that the out-of-state Standard companies have been brought within the jurisdiction of the court.

Standard Oil Co. (New Jersey), the Socony-Vacuum Corp., and the Standard Oil Co. of California filed answers in Attorney General James V. Allred's penalty and ouster suit at 2 p. m. today, as special appearances limited to attack upon the jurisdiction of the court here and as motions to quash the proceedings. The Shell-Union Oil Corp. filed a general answer.

Former Atty. Gen. W. A. Keeling, counsel for the Shell-Union Oil Corp., said the decision whether this company was to file an answer was to be reached during the day in conferences with attorneys.

Until Tuesday the question whether the three out-of-state Standard companies and the Shell-Union legally had been subjected to jurisdiction of the trial court at Austin had been undetermined by the court. No issue had been made of adequate citation upon the 11 other corporations.

The Sinclair Case

Tuesday morning the court turned to arguments over a plea of abatement and misjoinder by the Sinclair Oil & Refining Co., limiting arguments to the one contention that the company was not engaged in retail marketing until October, 1930, and that the general pleading of the State did not apply to it as to other companies. General arguments on misjoinder of parties, misjoinder of causes and abatement of the suit were to follow, with several companies' counsel taking part.

TURNER AND OLIVER HONORED BY A.I.M.E.

The annual election of officers of the American Institute of Mining Engineers by mail ballot was announced by A. B. Parsons, secretary, at the New York meeting, February 15-18. Scott Turner, director of the U. S. Bureau of Mines, was elected president for 1932, succeeding Robert E. Tally. Mr. Turner is a graduate of the University of Michigan, has served on the operating and consulting staffs of many companies in all parts of the world.

Vice presidents elected were H. N. Eavenson of Pittsburgh and H. A. Guess of New York. Louis S. Cates, Karl Eilers, S. R. Elliott, H. G. Moulton and William Wraith were chosen as directors.

Earl Oliver, Ponca City, Okla., was elected chairman of the Petroleum Division for 1932, and J. B. Umpleby, petroleum engineer, Norman, Okla., vice president.

JUDGE HUTCHESON ASKS CONFERENCE AT HOUSTON

AUSTIN, Tex., Feb. 22.—Drafting a Railroad Commission order to govern production in East Texas was suspended temporarily Monday to await a conference called for Houston Tuesday by Federal Judge J. C. Hutcheson. Judge Hutcheson invited Fred Upchurch, assistant attorney general, to attend. Upchurch has been working on a draft of the order that will be issued by the commission when called upon to resume control of the field.

Attorneys for Constantin and Wrather, and attorneys for Governor Sterling and General Wolters also will attend the conference. The governor's attorneys will seek a stay of execution on the decree pending an appeal to the United States Supreme Court.

Upchurch said it was possible that the decree might be changed as a result of the conference. Upchurch has finished work on the general conservation rules for the East Texas Field, but said he would withhold preparation of the order setting the allowable until after the conference Tuesday.

DRAFTING INTERSTATE COMPACT

Cicero I. Murray, chairman of the Oil States Advisory Committee, has announced that Congress soon would be asked to give its approval to the interstate oil compact. Draft of the proposed bill is being made by the committee's legal group consisting of Mr. Murray, Warwick M. Downing, Denver, and Kenner McConnell, Columbus, Ohio.

A.P.I. MAY CONFER ON WORLD CONTROL

NEW YORK, Feb. 22.—While the American Petroleum Institute is unwilling to meet with foreign oil interests for discussion of the so-called Kessler plan as a basis for world curtailment, it is sympathetic and has suggested postponing such a conference to a later date, according to advices from Europe this week.

Amos L. Beaty, president of the American Petroleum Institute, in a cable to the Rumanian Association of Petroleum Industrialists, which had asked the A.P.I. to suggest an alternative proposal if it was still convinced the Kessler plan was unacceptable by reason of American oil laws, said:

"Proposals are being made to our Congress, which, if enacted, might clear the way for definite and binding action on the part of our Government and industrialists. We therefore suggest that call of conference be deferred pending action on these proposals. We repeat our assurance of sympathetic attitude and await your advices."

Late Fields

COLORADO

DENVER, Colo., Feb. 23.—Water was reported to have made its appearance in the Platte Valley Petroleum Co.'s No. 1 Patterson, NE SE NW Section 24-6n-61, Greasewood Dome, in Weld County, northeastern Colorado. This is the discovery well which came in October 10, 1930. No. 1 Patterson is reported to have flowed 72 bbls. on February 13 and to have stopped flowing altogether the next day. Late reports are that 2,200 feet of fluid is standing in the hole and that the water is slightly salty. It is not certain yet whether it is bottom water or seepage from the Reiter-Foster Oil Co.'s No. 1 Johnson-Juhl, C SE SE Section 14-6n-61. This well was drilled through the Muddy sand and into the Dakota. Water from the latter sand stood 4,000 feet in the hole and on the Muddy for some time, but the past week steps were taken to plug off the Dakota. Heretofore, no water has been reported in any of the wells drilled to the Muddy.

OKLAHOMA

In the southern part of Oklahoma the new area southwest of Duncan, Stephens County, continues active with two tests showing for production and a new location announced. Continental Oil Co.'s No. 2 Dare, NW cor. SW SE, Section 2-2s-8w, after missing the shallower sand found a showing of oil in sand at 1,670-76 feet, and has landed casing to test. It is the south offset to No. 1 Dare, which made a producer at 1,360 feet.

G. L. Pace's No. 3 Allen, NW cor. SE SE NE, Section 3-2s-8w, found a showing of oil and gas at 1,444-48 feet and were preparing to test. Same operators announced a new location, No. 2 Green, SE cor. SW NE, Section 2-2s-8w, the west offset to P. L. Gilbert's No. 1 Green, completed about a week ago for 150 bbls. a day at 1,360 feet.

The wildcat test of Branch and Dameron, No. 1 Dameron, SE cor. SW NE, Section 11-3s-6w, found 2,000,000 feet of gas at 365 feet.

Carter Oil Co.'s No. 1 L. Lynn, SW cor. SE NE, Section 31-1s-2w, Tatums Pool, Carter County, has landed a liner and is testing the sand. It found a showing of oil in sand at 1,720-2,142 feet. The total depth is 2,197 feet.

Amos Drilling Co. and W. Gant's No. 1 Short, SW cor., Section 18-1s-2w, on the east side of the Tatums Field, has cemented casing at 1,846 feet after finding a showing of oil in sand at 1,852-2,015 feet, total depth 2,067 feet.

Lundy and others' No. 1 Spragins, NE cor. NW SW, Section 8-1s-2w, northeast of Tatums Field, is shut down at 2,500 feet.

The community test in Lincoln County, Barnsdall Oil Co., Carter Oil Co., Pure Oil Co., Prairie Oil & Gas Co., Producers & Refiners Corp., Tom Slick Oil Co., and Coline Oil Co.'s No. 1 Taylor, C SW NW, Section 17-14-5, found a showing of salt water in Simpson sand and was still drilling in the sand at 4,712 feet.

Gypsy Oil Co., The Texas Company, Sinclair Oil & Gas Co., Shell Petroleum Corp., and Barnsdall Oil Co.'s No. 1 Gray, NE cor. SW, Section 25-6-4, a wildcat in Pottawatomie County, was spudding.

Empire Oil & Refining Co.'s No. 3 B. Fish, NE cor. SW SE, Section 19-7-8, is a location, in the Fish Pool, in Seminole County.

Midwestern Oil Co.'s No. 1 Hall, in Section 25-3-9, Coal County, found 2,000,000 feet of gas at 1,090-1,102 feet.

KANSAS

Two Kansas City lime wells are being added to the Goodrich Pool, in Sedgwick County, Kansas, by the Continental Oil Co. which controls practically all the productive acreage in the area. Continental Oil Co.'s No. 1 Brown, in Section 15-25-1, is estimated at 60 bbls. a day from the Kansas City lime. Same company's No. 1 Smith, in Section 16-25-1, swabbed 480 bbls. of oil in 9½ hours from the Kansas lime at 2,613-14 feet. It is being tubed for pumping.

New operations in the Goodrich Pool include Continental Oil Co.'s No. 1 Hampton, SE cor. NW, Section 15-25-1, a new location.

Gypsy Oil Co.'s No. 1 Lamb, SE cor. NW, Section 12-26-1, in the Valley Center Pool, in Sedgwick County, was drilling at 2,850 feet. Continental Oil Co. and Gypsy Oil Co.'s No. 1 Bishop, NW cor. NE, Section 13-26-1, is being abandoned at 120 feet, and the rig will be skidded 80 feet east and a new hole started.

National Refining Co.'s No. 4 Murdock, C SE SE, Section 18-27-2, in Eastborough Pool, in Sedgwick County, was rigging up. It is the only operation in the north end of the Eastborough Pool.

J. R. Hays and J. Harwood's No. 1 Carson, NW cor. NE, Section 33-23-11, in the Seeley Pool, in Greenwood County, is making 200 bbls. a day from the Bartlesville sand at a total depth of 1,973 feet. It extends production in the area three-quarters of a mile south.

Twin Drilling Co.'s No. 1 Farver, in Section 16-20-1w, a wildcat in McPherson County, found a small showing of oil in the chat and was drilling deeper to the Viola lime at 3,065 feet. It is located about 4 miles south of production in the Ritz-Canton Pool.

Shell Petroleum Corp. and others' No. 1 Koehn, NE cor. NW, Section 36-19-2w,

(Continued on Page 96)

High Spots in Field News

OKLAHOMA

New rules applied in Oklahoma City. Dry hole in Lincoln County wildcat. Ray M. Collins named umpire for City Field.

KANSAS

Kansans want increase in allowable. Central western counties are due for exploration. Activity in Ritz-Canton area.

GULF COAST

Big well on South Louisiana dome. Most easterly coastal well flows 300 bbls. first hour of typical heavy gravity crude.

SOUTHWEST TEXAS

Two disappointments in Pettus Field. Increased activity in Escobas district. Possible shallow pool in Zavala County.

EAST TEXAS

Ninety-seven new locations and 97 wells completed. Now over 4,200 completions in field. Continuance of withdrawals from storage.

NORTH LOUISIANA, ARKANSAS, MISSISSIPPI, ALABAMA

Wildcat play planned in Mississippi, Alabama and northern Louisiana. Showing northeast of Zwolle Field outstanding development.

WEST AND NORTH TEXAS AND PANHANDLE

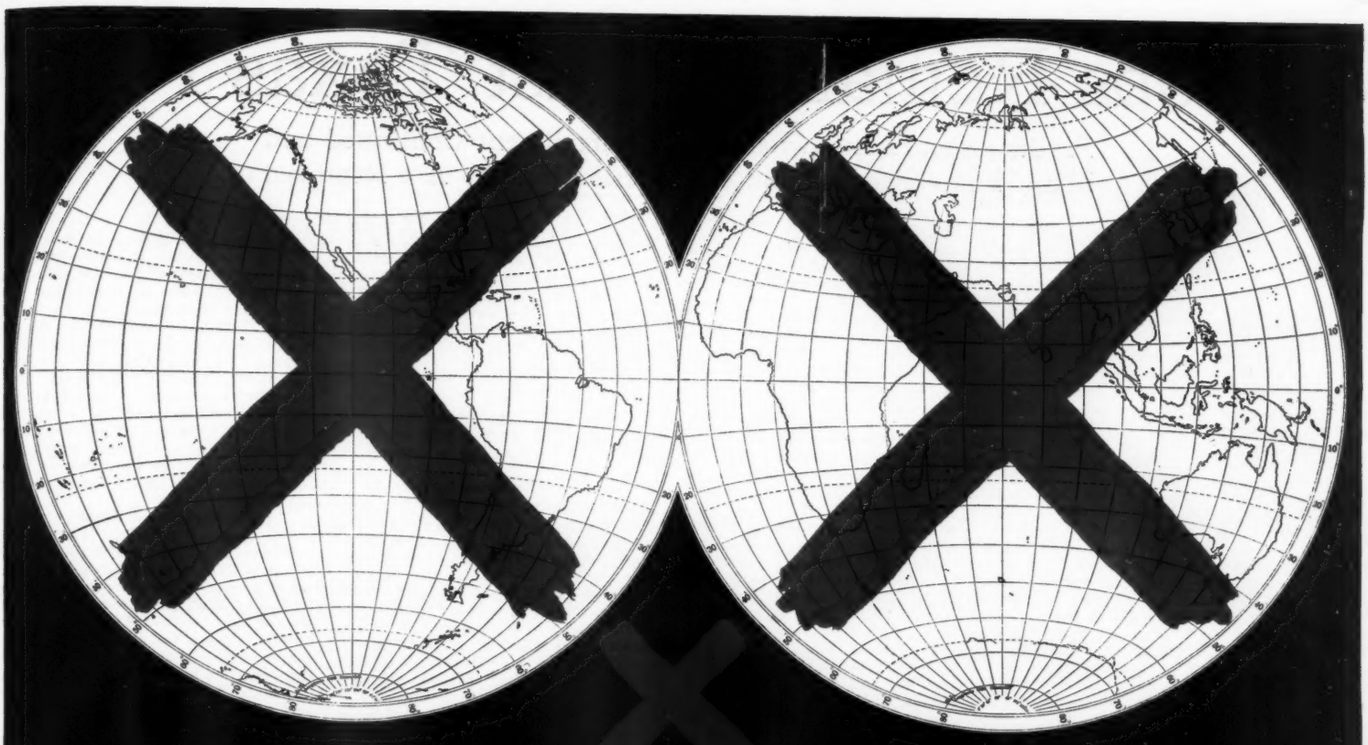
Ward County producing area extended. Eleven locations in Ranger and 17 in Wichita Falls district; four in Panhandle. Test in Presidio County.

CALIFORNIA

California production expected to remain around present figure for several months. Outside Kettleman Hills and curtailed areas most fields are in settled stage.

ROCKY MOUNTAIN AREA

Water reported in Greasewood Dome discovery well. Three tests to be drilled in district. Craig wildcat has another gas flow. New Operations in New Mexico.



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Troops Remain in East Texas Field

Producers and Landowners Want Curtailment Continued and Many Fear Disorder and Destruction if They Are Removed

By L. E. Bredberg

DALLAS, Tex., Feb. 22.—There were two more important happenings in the East Texas district during the week, the first, a notice from the Magnolia Petroleum Co. that it would cut its production, and takings from outside leases to 65 bbls. per day, from the allowable of 75 bbls. per day, but would purchase, produce and run oil for seven days a week instead of the six days as has been the vogue since the fore part of January. This increases production by 5 bbls. per well, per week, and will have a tendency to prevent oil from going to storage in the district, or being sold to small refineries, or in other markets as distress oil, and perhaps below the market price. This move is considered a good one by some operators, while others are against it, and consider it as a forerunner to another cut in daily production of each well in the field.

The second feature of the week was the decision of the three federal judges in regard to martial law in the district, on an injunction sought by two producers in the field. It was an exceedingly lengthy ruling, and was first misunderstood by those in authority in the State, but upon closer perusal it was found that the injunction did not go into effect for 15 days. During this time an appeal is expected to be filed by the governor, carrying the case to the U. S. Supreme Court. This will put the case in status quo and the troops will probably be maintained in the field, carrying on their work as they have been since August 17 when they were ordered into the field to shut in the wells and prevent disorder and riot.

Operators have been discussing the situation all week, and it is the consensus of opinion that the troops should not be withdrawn from the field, or the field turned over to the Railroad Commission for carrying out proration orders.

The troops are still on the job in the field, and have padlocked several wells, six on one lease, since the judges' ruling was published, giving proof that they are not to be superseded until the injunction really goes into effect, and orders are given for them to withdraw from their duties.

A very few operators were ready to take advantage of the uncertain situation which existed immediately after the ruling was published, giving ample proof of what would happen in case the troops were withdrawn, for if a few operators produced their wells open, offset wells would have to be produced likewise. The movement would rapidly spread over the entire 100,000 producing acres, throwing the district into the chaotic state which existed during July and the first two weeks in August, 1931.

Commission Handicapped

If the Railroad Commission does take over proration of the field it is expected by some, to announce a daily allowable of 75 bbls. per day for a seven-day week period, instead of 75 bbls. per day for six days each week, as many producers have been operating their wells under the voluntary shutdown movement. But when the commission steps in to take over the field, many injunctions will no doubt step in also to prevent it from interfering with the production of wells on some of the operators' leases. Such injunctions have tied the hands of the commission before this, making it powerless to act in curtailing production, and there seems to be nothing to prevent such injunctions from being filed again.

Tense Situation

Hundreds of telegrams and letters have been sent to Governor Sterling expressing the hope that he will see fit to keep the troops in East Texas, and will be able to do so. A county judge of one of the producing counties wired the governor stating that a tense situation existed in his county; that there was impending violence, and that the county authorities requested soldiers be retained in the county.

Ready for Mass Meeting

A mass meeting of operators, land and royalty owners was to be held in Tyler today, but due to the injunction not going into effect immediately, the meeting was temporarily postponed. Several plans for operating the field had been suggested at a meeting of operators in Dallas on February 20, and these plans were to be discussed at the proposed Tyler meeting. A mass meeting will no doubt be called in the near future to discuss the situation.

Two men have upset the equilibrium of the East Texas district, but if the truth were known, they no doubt would like to be able to make an "about face" and fall in line with the rest of the operators in the field who have been co-operating in curtailing production according to the governor's orders.

The field will continue to be produced as it has in the past, until further word is announced by the governor, and until that time, operators will be anxiously "standing by" to hear and know what is to happen, and in what position their leases will be placed.

Royalty Owners Would Suffer

If the wells are allowed to produce without restraint, the land and royalty owners in the district may expect more of their royalty oil shipped out of the district without remuneration for the same, just as was done during the unrestrained period last summer. By-passing would not have to be resorted to, as it has in the Gladewater area in the Lathrop Field, to run unreported oil, and the operators could "get by" with shipping oil without making out "run tickets" and paying the land and royalty owner. The land and royalty owners have come to realize that they have missed many checks which were due them, consequently will not stand by and permit such tactics to be carried out on their leases another time without retaliating. This retaliation would undoubtedly take such form that troops would be absolutely necessary to prevent serious trouble in many parts of the field.

Sunday Shutdown Results

The Sunday shutdown plan has been found to be unsuccessful from a producing standpoint due to the wells paraffining during the shutdown period, and also because many of the wells refuse to flow when opened on Monday, making it necessary to agitate by swabbing or pumping to bring them back on flow. This has necessitated purchasing pumping equipment before it would otherwise have been necessary, and has entailed expenses which some of the smaller operators could ill afford under the present small daily allowable, and conditions.

Flood Conditions

Another week's rain has put the field back into as bad, or worse condition than it was three weeks ago when roads throughout the field became impassable, mules and horses had to be winched out of mud holes, and tractors were used in dragging material and equipment to locations, and boats were used on some leases in order for the production men to get to the wells to open them so that they could produce their allowable. Some of these wells were standing under water, and long rod wrenches had to be used in "stabbing" the valves under the water, to turn the wells on and off.

97 New Locations

There were 97 locations staked in the district this week, the majority, as usual, in northern Gregg County. Ninety-seven wells were also completed, 36 of them being in the same area as the greatest number of locations. It is quite obvious that nothing is to stop or slow down drilling, perceptibly, in the district, until all of the smaller leases are drilled up, and the companies have as many wells drilled as they desire on the larger leases. What the total number of wells will be when drilling ceases can only be estimated at the present time, some saying there will be 6,000, while others contend that there will be over 8,000, and still others think 10,000 will be the ultimate total. There are now over 4,200 wells completed in the field, with no dry holes drilled within the producing area to date, and but little chances of there being any.

Barter and Trade

One company, preparing for the standardization of all of its wells in the field, is contracting for pumping equipment and paying for some out of oil produced on its leases. This same company some few months ago contracted with a drilling company to pay for drilling wells out of oil produced. Bartering for such work is frowned upon by many of the companies, but many different kinds of deals have been made in the district in order to get wells drilled and leases developed.

Southern Extension Test

The Stanolind Oil & Gas Co. and Pure Oil Co. have staked an interesting location on their 231-acre W. H. Siler lease in the Thomas White Survey in the southern Joiner area, Rusk County. This location is approximately 1 mile southeast of the nearest oil producer, The Texas Company's No. 1 Price, and would appear to be far east for production, but some geologists are of the opinion that the shore line swings east in that area, and that the Woodbine sand will produce to the east of the present eastern edge of the field, in that area, consequently it will be one of the most interesting tests yet drilled in this part of the extension.

Ortiz Drills Dry Hole

The Ortiz Oil Co. completed its No. 2 H. M. Hale in the T. J. Moore Survey, on the eastern side of the Joiner Field, Rusk County, for a dry hole, abandoning it at 3,727 feet after topping sand at 3,617 feet. This is another eastern edge marker for this area. The Texas Company drilled a dry hole on its Turner lease to the northeast soon after the Joiner discovery well was brought in. It was abandoned at 3,715 feet, and was one of the first defining tests in the field.

Kewanee Buys Lease

The Texas Pacific Coal & Oil Co., which owns 182 acres in fee in the G. H. Hampton Survey, western Gregg County, sold a lease out of this tract, including three producing wells and equipment to the Kewanee Oil & Gas Co. of Tulsa. Cost of the wells and equipment was placed at $20,000 each, and the lease was sold for a cash consideration of $2,500 per acre. The former company retained its one-eighth royalty under the lease.

Another sale during the week was made by the Fleetborn Oil Co. to the Rancho Oil Co. of Fort Worth. The lease is on the J. K. Edwards lands in the D. Ferguson Survey, Gregg County. Consideration was reported at $206,000 for the 106 acres and three producing wells.

Draw on Storage

Daily average distribution for the week ending February 15 shows a continuance of withdrawals from storage. Distribution for that period averaged 301,791 bbls. per day, and production averaged 279,053 bbls., a difference of 22,756 bbls. which came from storage, or around 137,000 bbls. withdrawn for the week, considering that the pipe line companies only operated for six days. Withdrawals for the last period averaged over 7,000 bbls. per day more than withdrawals for

(Continued on Page 75)

EAST AND EAST CENTRAL TEXAS WILDCATS

Week Ending February 22

ANDERSON COUNTY

Company, well, farm name, section and block—	Remarks:
C. R. Wilmuth et al's No. 1 N. B. Watson, 500 ft. from W line and 4,550 ft. from N of S line of survey in 8¼ of 129-ac. tract, M. Main Sur.	S.D. 1,530 ft.

ANGELINA COUNTY

Heiburt et al's No. 1 Long Bell Lumber Co., 160 ft. from S line and 200 ft. from E line of Sec. 9, H.&T.B. Sur.	Location.

BOWIE COUNTY

Logan and Elliott's No. 1 J. W. Smith, 9,600 ft. S and 2,500 ft. W of NE cor. of survey, Chas. Lewis Sur.	S.D. 4,503 ft.
W. S. Langford's No. 1 W. W. Whybark, 200 ft. from S and W of SW cor. of J. A. Dyer Sur.	S.D. 1,830 ft.
Lee Timberlake et al's No. 2 Julius N. Tidwell, 655 ft. from E and 2,510 ft. from S of survey in L. M. Rice Sur.	S.W. on D.S. test; S.D. 3,012 ft.

CAMP COUNTY

Monitor Oil Co.'s No. 1 G. L. Merrill, 3,400 ft. from N line and 6,900 ft. from W line of survey, E. Mathews Sur.	S.D. 3,575 ft.

CHEROKEE COUNTY

Bridges and Candler's No. 1 Berryman, center of Berryman tract, H. Kimble Sur.	S.D. 1,000 ft.
Denman et al's No. 1 Mrs. Renfroe, 330 ft. N of S line and 330 ft. E of W line of farm, Uriah Moore Sur.	Derrick.
Harper and Perkinson's No. 1 J. T. Lowery, 650 ft. from N line, 150 ft. from W line of Blk. No. 5 on a 139.6-ac. tract, 4 miles W of Troupe, C. B. Jennings Sur.	Rigging up.
Merry Bros. and Perini's No. 1 Annie Kelley, 330 ft. from N line and 443 ft. from E line of 393-ac. tract and 90-ac. lease, M. De Los Santos Coy Sur.	Rigging up.
Wilson & Stubbs' No. 1 L. Robart, 450 ft. from S and 150 ft. from W line of lease, J. B. Wolfin Sur.	S.D. 2,035 ft.

DALLAS COUNTY

Long Creek Dev. Co.'s No. 1 T. J. Lupton, center of 160-ac. tract, 3¼ miles N of Mesquite, J. Johnson Sur.	Rigging up.
Paris' No. 2 Wilkinson, 2,787 ft. from NW and 3,241 ft. from SW of John P. Anderson Sur.	T.D. 1,230 ft.; S.D.
Joe Wilson's No. 1 fee, 600 ft. from N line and 600 ft. from W line of 1,500-ac. tr., Jno. Scrogga Sur.	S.D. 1,150 ft.

(Continued on Page 77)

CUT POWER and MAINTENANCE COSTS

with

EMSCO FALK

PRODUCTION UNITS

Highly efficient—Double Reduction Herringbone Gears

Long lived, oversize Airplane Type Bearings, extra rugged construction throughout

Flywheel decreases current fluctuation with motor drive, eliminates rod shock with engine drive: SAVES POWER

V-Belt Drive, suitable for Gas Engine, Diesel Engine, Electric Motors

Emsco-Bowlus Crank Counterbalance provides maximum balancing effect with minimum weight

Rods and tubing pulled with stationary or portable production hoist, eliminates necessity of additional power pulling units

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THE CONTINENTAL SUPPLY COMPANY

GENERAL OFFICES: ST. LOUIS

THE CONTINENTAL SUPPLY CO., LTD.—224 Traders Building, Calgary, Alberta, Canada...*Export Offices:* CONTINENTAL EMSCO CO Inc., *74 Trinity Place, New York—London Offices:* 316-17 Dashwood House, Old Broad St., E C 2. CONTINENTAL EMSCO S. A. R., Strada Marfurilor, Ploesti, Romania

CONTINENTAL

More Acreage Proved in Ward County

Presidio County to Have First Test in Year. Seventeen Locations in Wichita and Eleven in Ranger. Forty-four Completions

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Feb. 22.—Stanolind Oil & Gas Co.'s No. 1 Weiss in southern Ward County has finally been completed for a 190-bbl. well, extending the Barker area, and proving more acreage to production in this part of the county. It is in Section 4, Block 34, H.&T.C. Survey. It was plugged back from 2,415 feet to 2,383 feet before the test was made. Tubing has been run and the well pinched to 50 bbls. per day.

Eppenauer Drilling Co.'s No. 1 Purcell, Section 17, same block and survey, 3 miles west of No. 1 Weiss, has drilled past the oil showings made at 2,683-84 and 2,694-95 feet and is shut down at 2,740 feet without encountering salt water. It was estimated good for around 30 bbls. daily from the above pays, and may be plugged back to produce the well from those horizons after a shot.

Test in Presidio

James F. Sadler of Los Angeles will drill a 3,500-foot test on the Bledsoe ranch in Section 15, Block 351, G.C.&S.F. Survey, Presidio County, the first test to be drilled in this county for over a year. This test is 3 miles northeast of the town of Presidio.

Ector County

Weekly Oil Corp., McCurdy and Casteel's No. 1 Cowden in Ector County is drilling at 4,025 feet. The test was expected to pick up the pay between 3,095 and 4,050 feet, but so far has not contacted the horizon. It is in Section 33, Block 43, Township 2s, T.&P. Survey.

Reagan County

Group No. 1 Oil Corp. and Continental Oil Co.'s No. 1-B University, the first deep producing well in the Big Lake Field, Reagan County, produced 307 bbls. with 1,222,000 feet of gas for the 24 hours ending February 21. No. 2-B University is washing in preparing to test; total depth is 8,740 feet. No. 3-B University gauged 2,760 bbls. with 12,116,000 feet of gas; total depth is 9,020 feet. This is the deepest well in the pool. No. 4-B produced 6,227 bbls. with 37,281,000 feet of gas.

Crockett County

Lease trades continue to attract attention to Crockett County, the Humble Oil & Refining Co. and Stanolind Oil & Gas Co. continuing to take acreage in and around Blocks UV and WX in the G.C.& S.F. Survey. The latter company will drill a test to the Ordovician, in this area, but has not yet announced its proposed location. This will be one of the most interesting tests drilled in the Permian Basin for many months.

Humble Oil & Refining Co. has two torsion balance crews working near Post in Garza County and Snyder in Scurry County. They recently moved from Dawson County, where they had completed eight weeks' work.

RANGER AND WICHITA FALLS

There were 11 locations staked in the Ranger district this week: 5 in Brown, 3 in Coleman and 1 each in Callahan, Eastland and Palo Pinto Counties.

There were 17 locations staked in the Wichita Falls district: 2 in Archer, 7 in Wichita, 7 in Young and 1 in Cooke County. There were 44 completions in this district. Seven were in Archer, one in Jack, one in Montague, eight in Wichita, one in Wilbarger and one in Young County. The latter county is assuming some of its past appearance when it was the most active area in the Ranger or Wichita Falls district. This activity is due to the fact of the county being known as the "little fellow's area" because the majority of the producers are shallow wells, cheaply drilled, and the oil is of high gravity, bringing a fair price under present conditions, paying the best return on small capital at this time.

Bradley and others' No. 1 Maxwell, 6 miles south of Chalk Hill in Archer County, is another deep test which proved a "duster," being abandoned at 2,100 feet. Elevation is 1,118 feet. Deep Oil Development Co. and Lindsay's No. 2 Wilson in the Chalk Hill Pool was completed for 744 bbls. in 24 hours. The company is ready to drill its No. 3 Wilson in Block 119, A.T.N.C. Survey, 660 feet south of No. 1. This will be the most southerly test in the field.

Prairie Oil & Gas Co. and Amerada's No. 1 M. Bridges, in the William Metcalfe Survey, a south offset to the two companies' Edgin sand producer in Palo Pinto County, has evidently passed up that shallow sand for it encountered only a rainbow showing of oil from 1,702-05 feet. It is drilling to the deeper pay found in wells to the north, around 1,750-60 feet.

Pipe line runs from pools in the Wichita Falls district for the week ending February 20 averaged 52,765 bbls. per day. This includes South Young, Jack, Throckmorton and Haskell Counties.

PANHANDLE DISTRICT

There were four locations staked in the Panhandle district during the week: two in Carson, one in Gray and one in Hutchinson County. There were no wells completed.

COMPLETIONS IN WICHITA FALLS DISTRICT

Archer County

Gohlke and Petroleum Production Co.'s No. 1 Wilson, dry and abandoned, total depth 1,601 feet. Beer and Kirkwood's No. 1 Herron, dry and abandoned, total depth 1,960 feet. M. M. Bradley and others' No. 5 Wilson, dry and abandoned, total depth 2,100 feet. Bridwell Oil Co.'s No. 6 Green, sandy lime 1,115½-35 feet, initial production 75 bbls., shot 80 quarts, total depth 1,135 feet. Continental Oil Co.'s No. 2 Falls, sandy lime 1,082-1,100 feet, initial production 100 bbls., shot 100 quarts, total depth 1,100 feet. Perkins and Cullum's No. 5 Falls, sandy lime 1,112-15 feet, shot 80 quarts, initial production estimated 100 bbls., total depth 1,115 feet. United Producers Co.'s No. 1 Logan, sandy lime 1,200-13 feet, shot 90 quarts, initial production 11 bbls., total depth 1,215 feet.

Jack County

P. A. Rundell and others' No. 1 Patterson, temporarily abandoned location.

Montague County

Bridwell Oil Co.'s No. 1 Tucker, oil sand 1,234-48 feet, initial production 185 bbls. second 24 hours, total depth 1,249 feet.

Wichita County

F. C. Baldwin's No. 1 Overall, oil sand 826-35 feet, initial production 5 bbls., total depth 835 feet; No. 3 Overall, oil sand 554-63 feet, initial production 5 bbls., total depth 563 feet; No. 4 Overall, oil sand 958-64 feet, initial production 5 bbls., total depth 964 feet. C. W. Clark's No. 2 Munger, oil sand 1,038-43 feet, initial production 25 bbls., total depth 1,043 feet. Hunter and Venmex's No. 1 Waggoner, dry and abandoned, total depth 1,888 feet. Morgan and Anderson's No. 21 E. E. Goetze, dry and abandoned, total depth 500 feet; No. 26 Goetze, oil sand 892-904 feet, initial production estimated 75 to 100 bbls., total depth 904 feet. Reno and Goldsmith's No. 5 Roller, oil sand 1,100-1,111 feet, total depth 1,146 feet, plugged back to 1,114 feet, initial production 38 bbls.

Wilbarger County

Waggoner Refining Co.'s No. 14 Waggoner, sandy lime 2,539-43 feet, initial production 22 bbls. oil and 3 bbls. of water, total depth 2,543 feet.

Young County

Floyd Ard's No. 1 Jeffery "D," dry and abandoned, total depth 896 feet. W. E. Bernhard's No. 1 Morrison, dry and abandoned, total depth 508 feet. Bridwell Oil Co.'s No. 1 Routon, dry and abandoned, total depth 803 feet. Ewing and others' No. 1 Jeffery, dry and abandoned, total depth 945 feet. Fain and McGaha's No. 1 Dunagan, dry and abandoned, total depth 1,053 feet. N. D. Goldsmith's No. 1 Dunagan, oil sand 938-44 feet, initial production 53 bbls., total depth 944 feet. Helm and Hamilton's No. 1 Russell & Co., dry and abandoned, total depth 526 feet. Lee Hamilton and others' No. 1 Clifton, dry and abandoned, 825 feet; No. 1 A. Willerman, dry and abandoned, total depth 743 feet. W. H. Hamon's No. 1 Bullock, dry and abandoned, total depth 750 feet.

E. L. Kessler's No. 1 Logan, oil sand 560-88 feet, initial production 15 bbls., total depth 588 feet. King Royalty Co.'s No. 36 Larimore, oil sand 698-703 feet, initial production 100 bbls., total depth 703 feet. Hill Kleiner's No. 3 Johnson, junked and abandoned. Kleiner and Riggs' No. 5 Larimore, oil sand 699½ feet, initial production 70 bbls. oil and 20 bbls. of water, total depth 600½ feet; No. 6 Larimore, oil sand 703-05 feet, initial production 216 bbls., total depth 705 feet. P. P. Langford's No. 1 Boyd, dry and abandoned, total depth 506 feet. F. Lewis' No. 1 Herring, dry and abandoned, total depth 1,005 feet. W. N. Maer's No. 1 Bailey, dry and abandoned, total depth 884 feet. Earl Parker's No. 1 Bullock, dry and abandoned, total depth 1,570 feet. Roberts Oil Corp.'s No. 1 J. W. Davis, oil sand 858-60 feet, initial production 5 bbls., total depth 862 feet.

Seitz, Comegys, Seitz' No. 4 Finch, dry and abandoned, total depth 712 feet. United Producers Co.'s No. 4 Larimore, oil sand 688-93 feet, initial production 90 bbls., total depth 693 feet. O. M. Wallace's No. 1 Anderson, dry and abandoned, 602 feet. Charles Albright's No. 3 A. Bowers, oil sand 1,956-61 feet, initial production 100 bbls., total depth 1,961 feet, completed December 29, 1923, drilled deeper, oil sand 1,956-72 feet, initial production estimated 120 bbls. in 24 hours, total depth 1,972 feet. O. Bratcher's No. 1 E. S. Graham, junked and abandoned, total depth 570 feet. Panhandle Refining Co.'s No. 1 Bridwell, dry and abandoned, total depth 3,310 feet.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week Ending February 22

BRISCOE COUNTY

Company, well, farm name, section and block— Remarks:

Humble Oil & Refining Co.'s No. 1 C. Adair estate, 2,500 ft. from N line and 2,100 ft. from E line of Sec. 7, Blk. G-4 ..... Derrick.

CARSON COUNTY

Continental Oil Co.'s No. 4 Block, 330 ft. from N, 990 ft. from E, Sec. 111, Blk. 4, I.&G.N. Sur. ..... Drlg. 2,300 ft.

H. A. M. Oil Co.'s No. 2 Cooper, 330 ft. from S and E. Sec. 5, Blk. 9, I.&G.N. Sur. ..... Location.

Skelly Oil Co.'s No. 27 Schaffer, 1,265 ft. from S and 440 ft. from W. Sec. 88, Blk. 4, I.&G.N. Sur. ..... Cellar.

Texoma Natural Gas Co.'s No. 1-S Burnett, center SE, Sec. 94, Blk. 5, I.&G.N. Sur. ..... Location.

Texhoma Nat. Gas Co.'s No. 1-G Gore, 1,320 ft. from S and 1,327 ft. from W. Sec. 42, Blk. 4, I.&G.N. Sur... Drlg. 1,800 ft.

CHILDRESS COUNTY

C. L. Sloan et al's No. 1 B. P. Smith, Sec. 49, F. P. Knott lands ..... T.D. 5,000 ft.

COLLINGSWORTH COUNTY

Dixon et al's No. 1 Bell, 330 ft. N, 1,320 ft. W, Sec. 102, Blk. 21, H.&G.N. Sur. ..... S.D. 2,503 ft.

Downey et al's No. 1 Beasley, SE cor. SW SE, Sec. 95, Blk. 15, H.&G.N. Sur. ..... Rigging up.

DEAF SMITH COUNTY

Western Union Oil Co.'s No. 1 Farwell, C NW, Sec. 18-3n-2e ..... S.D. 275 ft.

GRAY COUNTY

Back & Barber's No. 1 Back, 660 ft. from S and 330 ft. from W, Sec. 140, Blk. 25, H.&G.N. Sur. ..... Drlg. 1,500 ft.

Boyes et al's No. 1 Colebank-Morse, 330 ft. NE, Sec. 65, Blk. 25, H.&G.N. Sur. ..... Spudded and S.D.

Brown et al's No. 1 Duncan, 330 ft. S and E, NW, Sec. 93, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,785 ft.

Danciger O. & R. Co.'s No. 3 Byrum, 330 ft. from N line, 330 ft. from E line, Sec. 158, Blk. 3, T.&N.O. Sur. .. Drlg. 1,245 ft.

R. B. Etter et al's No. 1 Chapman, 275 ft. from N line and 110 ft. from W line of S half SW Sec. of Blk. 36, H.&G.N. Sur. ..... Derrick.

Foster's No. 1 Webb, 330 ft. from S and W, Sec. 43, Blk. 25, H.&G.N. Sur. ..... Cellar.

Gulf Oil Corp.'s No. 1 Catlin, 2,310 ft. from N line, 330 ft. from E line, Sec. 27, Blk. 3, I.G.N. Sur. ..... Drlg. 2,285 ft.

Jean Pet. Co.'s No. 1 Furneaux Bros., 330 ft. N and W, cor. SE, Sec. 200, Blk. B-3, H.&G.N. Sur. ..... S.D. 3,010 ft; cleaned up fishing job.

Jewel Oil Co.'s No. 1 Meera, 330 ft. from S and W of NW SW, Sec. 106, Blk. 3, I.&G.N. Sur. ..... T.D. 2,935 ft.

Nelson et al's No. 1 Crews, 330 ft. S and E, NW, Sec. 13, Blk. 35, H.&G.N. Sur. ..... S.D. 2,620 ft.; estimated 4,000,000 ft. gas.

Nipper et al's No. 1 Morse, 330 ft. from N and E, Sec. 1, Blk. 26, I.&G.N. Sur. ..... S.D. 2,600 ft.

(Continued on Page 32)

DAILY AVERAGE SHIPMENTS FROM WEST TEXAS

Week Ending February 11

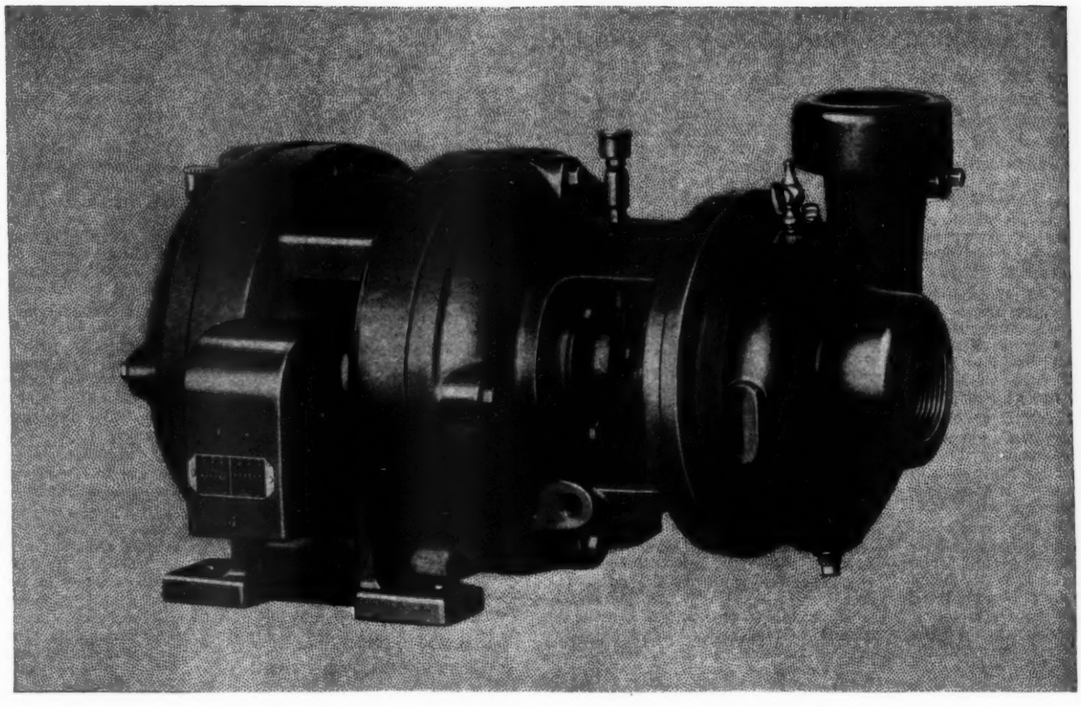
Shipments Through Main Trunk Lines

Company, size and location—	Bbls.
Atlantic P. L. Co., 10-in., Houston ..	17,000
Gulf P. L. Co., 10-in., Ranger	17,037
Humble P. L. Co., 2-8-in., San Angelo.	36,531
Humble P. L. Co., 12-in., Station "A".	41,754
Illinois P. L. Co., 2-8-in., Del Rio ..	26,513
Magnolia P. L. Co., 8-in., DeLeon	2,000
Shell P. L. Corp., 10-in., Houston	29,450
Shell P. L. Corp., 10-in., Cushing, Ok.	26,940
Texas P. L. Co., 12-in., Houston	12,833
Total	221,644

Shipments to Refineries

Col-Tex Ref. Co., Colorado	5,500
Concho Ref. Co., San Angelo	125
Cosden Ref. Co., Big Spring	6,374
Continental Ref. Co., Santa Rita	none
Gulf Ref. Co., Sweetwater	3,001
Humble O. & R. Co., McCamey	8,471
Marathon Ref. Co., Del Rio	1,211
Pasotex Ref. Co., El Paso	4,200
Rio Grande Ref. Co., El Paso	1,200
The Texas Co., El Paso	1,000
Wickett Ref. Co., Wickett	none
Total	31,101

Shipments by tank car	none
Daily average distribution	252,817
Daily average production of West Texas and Lea County, N. Mex. ..	207,291
Daily average from storage	45,526



Type SSU—A Useful, Small Pumping Unit. Capacities—30 to 400 g.p.m.

TYPE SSU Pumping Units, while scarcely larger than a motor alone, handle capacities from 30 to 400 gallons per minute, for heads up to 100 feet. Being small and light in weight, they are easily transported and any rigid support is sufficient as a foundation. Because the pump impeller is attached to the motor shaft, alignment troubles are eliminated. The motor housing near the pump is completely closed so no liquid can get into the motor windings. These type SSU pumps can be furnished with standard open type, enclosed fan-cooled or explosion-proof induction motors, and with single phase motors up to the 5 h.p. size. These units were brought out in 1927 and the line is exceptionally complete providing the most economical pump for any condition within the range carried. Pumps for general use are described in Bulletin 1647-A, for oil field service in Leaflet 2143.

Centrifugal Pumps

The Allis-Chalmers line consists of low, moderate, and high head single stage pumps of 1″ to 72″ discharge, multi-stage pumps for working pressure up to 1500 pounds, high efficiency paper stock pumps, and pumps for special applications.

Allis-Chalmers Manufacturing Company, Milwaukee

ALLIS-CHALMERS

Pipe Line Construction News

KANSAS CITY INDUSTRIAL LINE IS GIVEN HEARING

JEFFERSON CITY, Mo., Feb. 22.—Hearings before the Missouri Public Service Commission on the application of the Kansas City Industrial Fuel Gas Co. for a permit to sell industrial natural gas in Kansas City have been adjourned until a further date, to be decided by the commission, at which time it is said the organizers of the company will show their financial arrangements and the source of gas supply.

At the hearing the commission announced it had decided the Kansas City Industrial Fuel Gas Co. should make a showing not only as to convenience and necessity for a permit, but also should show the availability of gas supply and the arrangements for financial support.

Arthur S. Butterworth of Columbus, Ohio, president of the newly organized gas concern, said his company did not desire to divulge either the gas supply or financial setup because of undercurrents of opposition to the new project.

Oliver T. Remmers of St. Louis, attorney for the Butterworth corporation, objected to the commission's ruling and asked permission to file a memorandum in support of his views. He was granted two weeks in which to prepare his document. Attorneys for the Kansas City Gas Co., headed by Charles H. Mayer of St. Joseph, asked for a week to reply to the memorandum.

Winston P. Henry of Tulsa, oil and gas producer, was called by the Butterworth interests to testify to the availability of gas fields with in a 400-mile radius of Kansas City. He said he had approached various producers who were willing and eager to supply natural gas for the Kansas City Industrial Fuel Gas Co. In reply to Mayer's questioning he refused to divulge the companies.

Henry told of negotiations last fall with the Utilities Power & Light Corp. of Chicago, controlled by the Harley L. Clarke interests, which owns large gas acreages in southwestern Kansas. He said the Butterworth group virtually had completed arrangements for a gas supply and was waiting final word, when it was informed the contracts could not be signed. Investigation revealed, he said, that the Utilities Power & Light Corp. had contracted to sell 20,000,000 feet a day to the Doherty pipe lines.

A potential market survey was introduced in evidence by R. L. Baldwin, Kansas City consulting engineer. He testified natural gas could be used to replace 775,000 tons of coal and 60,000,000 gallons of fuel oil annually, which would require 100,000,000 of gas daily. The value of such a market at an average price of 17 cents a thousand feet of natural gas would be approximately $6,000,000 a year.

Harry K. Ihrig, gas engineer and secretary-treasurer of the Kansas City Industrial Fuel Gas Co., testified the cost of a pipe line planned by the company with eight compressor stations would be $17,257,378, and estimated the life of the pipe line would be about 50 years. He said gas could be purchased at the field for about 4 cents a thousand feet and estimated the total cost of bringing the gas to Kansas City, including the purchase price, would be slightly in excess of 7 cents a thousand feet.

RIO GRANDE CITY LINE

Rio Grande Public Service Corp., Rio Grande City, Tex., is considering installation of a natural gas pipe line from gas fields near Rio Grande City to points in Rio Grande Valley.

JOINTS AND COATINGS ON GAS MEN'S PROGRAM

What promises to be one of the outstanding features of the ninth annual conference of the distribution committee, technical section, American Gas Association, which will open a three-day session in Birmingham on April 6, will be ample opportunity for a thorough inspection of the manufacture of different types of cast iron pipe, an industry for which the Alabama city is noted.

F. A. Lydecker, Public Service Electric & Gas Co., Newark, N. J., chairman of the program committee, has announced that a full day has been set aside for the inspection of Birmingham's manufacturing plants. Competent guides will be provided and several of the various operations in the plants will be so timed that all attending the conference will have a chance to view them. Most types of pipe are made in Birmingham. These include Pitcast, deLavaud, McWane and Monocast. Factory laboratories also will be open to the American Gas Association visitors, and they will be permitted to see the latest development in pipe joints and pipe materials.

Among the principal topics to be discussed at the conference will be those of changeovers from manufactured to natural gas; service to customers; employing training; pipe joints, pipe coatings and corrosion; unaccounted for gas; corrosion research as carried on at the U. S. Bureau of Standards, under the auspices of the American Gas Association corrosion committee and economics of moving locked and inactive meters.

The open forum will be continued this year and it is expected that many engineers who have local problems will take advantage of this opportunity of bringing them before the conference.

All business sessions of the conference will take place at the Tutwiler Hotel.

Second Session, April 6, 2 P. M.

Report—Pipe Joints Committee: H. W. Battin, chairman, United Gas Improvement Co., Philadelphia, Pa.

Paper—Pipe Joint Research at A.G.A. Laboratory: K. R. Knapp, A.G.A. Testing Laboratory, Cleveland, Ohio.

Symposium on Welding—Welding Procedure for and Physical Characteristics of Arc Welded Pipe Joints: O. A. Tilton, General Electric Co., Schenectady, N. Y. Oxy-Acetylene Welding of Steel Pipe: E. A. Doyle, Linde Air Products Co., New York. Pipe Line Welding: R. S. Fuller, Pacific Gas & Electric Co., San Francisco.

Third Session, April 7, 8 P. M.

Report—Committee on Conversion from Manufactured to Natural Gas: George Wehrle, chairman, Public Service Co. of Colorado, Denver.

Paper—Changeovers from Manufactured to Mixed Gases in Chicago: W. J. Buckley, Peoples Gas Light & Coke Co.

Fourth Session, April 8, 9:30 A. M.

Report—Meters Committee: J. E. Overbeck, chairman, Columbia Engineering & Management Corp., Columbus, Ohio.

Fifth Session, April 8, 2 P. M.

Report—Activities of the Committee on Lost and Unaccounted-for Gas: J. M. Pickford, chairman, Midland United Co., Chicago, Ill.

Report—Subcommittee on Pipe Coatings and Corrosion Research: J. K. Crowell, chairman, S. R. Dresser Manufacturing Co., Bradford, Pa.

Presentation—Field Methods for Estimating Soil Corrosiveness: Dr. Scott Ewing, research associate, U. S. Bureau of Standards.

Paper—Electrical Conductivity of Pipe Coatings: R. J. Kuhn, New Orleans Public Service, Inc.

Bordering on the natural gas area, Birmingham is expected to attract an unusually large number of natural gas men.

Papers on the tentative program include the following:

First Session, April 6, 9:30 A. M.

Report—Committee on Cast Iron Pipe Standards: C. C. Simpson, Jr., chairman, Consolidated Gas Co. of New York.

Laying Lengths of Mechanical Joints: Walton Forstall, Philadelphia Gas Works Co.

OIL IS NOW FLOWING IN MEXICO CITY LINE

MEXICO CITY, Feb. 20.—Mexico City's first oil pipe line was formally inaugurated Friday when oil began to flow through the 300-mile line which connects lofty Mexico City with sea level petroleum sources.

The line has been called the highest in the world. It passes over mountains more than 9,000 feet high. Mexico City is 7,400 feet above sea level.

This oil is brought to the suburb of Atzcapotzalco, where a large refinery has been erected by the British Eagle Oil Co. The line starts at Palma Sola near Tuxpan, state of Vera Cruz. Its capacity is from 1,200 to 1,500 cubic meters of petroleum daily. The line has been under construction since October, 1930, and together with the refinery, cost about 10,000,000 pesos.

NORTH PENN GAS LINE

WELLSBORO, Pa., Feb. 20.—Work on the North Penn Gas Co.'s transmission line between Mansfield and Blossburg is progressing rapidly and it is expected will be completed in a week. The company will open an office soon in the Evans block, on Main Street. Some time this week at least 150 local workmen will be put on the construction work in the town of Blossburg by contractor Sylvester Rich of Bradford.

The pipe line from the Hungiville well on the Booth farm, Hebron Township, Potter County, has been completed and gas is now going into the lines of the Allegany Gas Co.

The New York State Natural Gas Corp., a subsidiary of the Standard Oil Co.., has made a deal with the Potter Development Co., a subsidiary of the Allegany Gas Co., to purchase the gas produced in Eulalia, Hebron and Clara Townships, Potter County.

LINE TO OMAHA COMPLETED

The most important recent development in the Northern Natural Gas system was the completion of arrangements for the use of natural gas by the three largest packing plants in Omaha. The packers' line, 5,700 feet of 18-inch pipe, goes to the south city limits of Omaha where it will receive gas from the Northern Natural border station.

Natural gas comes to Omaha through an 18-inch high pressure line, which taps the 24-inch main line near Plattsmouth, 16.1 miles south of Omaha. These packing plants will use more than 10,000,000 feet daily, which is more than the daily average output of the manufactured gas plant of Omaha and equivalent in heat value to nearly double the output of the city plant.

LOS ANGELES EXPANSION

LOS ANGELES, Calif., Feb. 20.—Los Angeles Gas & Electric Co. expects to add 10 miles of commercial gas mains, 8,000 gas services, 5,000 gas meters, and 3,600 gas regulators to its equipment as part of its $4,000,000 1932 campaign, according to announcement of Addison B. Day, vice president.

NATURAL GAS SYSTEM PROJECTED IN ITALY

Two engineers, V. Baldini and V. Valduga, have a project for the utilization of the gas from the wells recently brought in at Fontevivo and Salsomaggiore, Italy. Their plan includes deepening a number of wells in the Fontevivo area to a depth of 200 to 250 meters. Erection of a central station for storage and dispatch of gas. Transport of the gas through a pipe line, using compressor pumps, to as far as Parma. Construction of a transformer station whence the gas may be distributed by the usual pipe methods.

A second scheme proposes equipment of a chemical laboratory at Fontevivo in connection with the gas works. Construction of equipment for the recovery of petrol from the gas. Transport of gas to Milan for local industries. Erection of a distribution center there for smaller users.

A third scheme proposes transport of the gas to Brescia and Bergamo and the industrial neighborhoods near these places.

By the carrying out of the scheme the towns of Parma, Milan, Bergamo, Brescia and Cremona would be supplied with natural gas. Two American companies, that specialize in the utilization of natural gas, are interested in the project; and concrete financial proposals have been formulated. These imply an extensive distribution area for natural gas within a short period. It is also proposed to form a company which, supported directly by the government, would take over the concession for the utilization of the gas. It is, however, possible that a private company may be formed to undertake the scheme. All the proposals have been made in close agreement with the ideas of the Azienda Generale Italiana Petroli (A.G.I.P.).

KANSAS OIL AND GAS LINES

The Shell Petroleum Corp. is planning to construct a 6-inch oil line extending its present system in the Voshell Pool, Kansas, to the new oil and gas well about 6 miles north. The majority of the acreage in the new area in Section 35-19-3w, McPherson County, is controlled by the Shell which owns approximately 4,000 acres in the vicinity. The new line will be large enough to handle the immediate needs but should this district develop into another large pool, additional lines will be necessary. There are two other tests drilling, one about a half mile north and the other about a mile north.

A 6-inch gas line into the same area is to be constructed by the Kansas Pipe Line Co. It will be an extension of the company's present system and will be about 3½ miles long. The Kansas Pipe Line Co. furnishes gas to a number of communities and has been increasing its number of franchises during the last few months.

NORTHERN NATURAL LINES

Three new towns have been added to Northern Natural Gas Co. with the addition of Wells, Dodge Center and Kasson in southern Minnesota. This brings the total number of communities served to 128. Those now served by distributing divisions of the Northern Gas & Pipe Line Co. total 49, as follows: Nebraska 21, Kansas 15, Iowa 9 and Minnesota 4.

The system now has a total of 1,909 miles of pipe line, of which only 16 miles, from Plattsmouth to Omaha, is under construction. Nebraska leads in the mileage with 672.6; Kansas, 508; Iowa, 418.8; Minnesota, 116.5; Texas, 78.1; South Dakota, 68.4; and Oklahoma, 46.6.

Unity

A NATURAL GAS SYSTEM is a unit—yet it has a highly complex structure. Capital, labor and equipment are combined in it . . . Specialized and departmentized activities run through it . . . Finance, engineering, construction, management, enter into it . . . Diverse forces and influences must be reconciled and harmonized in a well-balanced, smoothly-functioning whole . . . So complex a unit demands unit control, under a unit responsibility.

SUCH unit control, under such unit responsibility, is afforded by the Hope Engineering Company—the oldest organization of its kind in the Natural Gas industry. While the activities of the Hope Company are classified under five departments—Field and Market Analysis *** Engineering Counsel and Design *** Organization and Finance *** Construction and Equipment *** Management and Operation—they function as a unit, with a unit responsibility "from well to meter".

HOPE ENGINEERING COMPANY

Engineers and Contractors in Pipe Line Construction

FIELD AND MARKET ANALYSIS • ENGINEERING COUNSEL AND DESIGN • ORGANIZATION AND FINANCE
CONSTRUCTION AND EQUIPMENT • MANAGEMENT AND OPERATION

Mount Vernon, Ohio ~ New York, N. Y.

HOPE

• AMERICAN INDUSTRY NEEDS MORE NATURAL GAS •

PRORATION INFLUENCE ON INDUSTRY'S COURSE

(Continued from Page 18)

portance in their bearing upon the economic consequences of proration.

Economics of Curtailment

Before proceeding further with the specific analysis, it is desirable to examine briefly the economic principles that underlie curtailment activities in general. Commodities in their relationships to markets are ruled by economic laws, to which the plans of producers have to conform if favorable results are to be obtained. The simplest and most important of these laws is the one that may be condensed in the statement that supply and demand are brought into adjustment by the free movement of prices. No way has apparently been devised for defeating this law, at least for very long. Every plan known to the writer for curtailing supply has also taken the quality of freedom from price, and the consequences of this error has been the ultimate defeat of the objectives of all such plans. If producers, faced with overproduction, would do precisely the same things that they would do under low prices, and their bankers and the public likewise, their plans would operate in conformance with economic laws and success would crown their efforts. In practice, however, producers seek to retard supply by their own efforts while at the same time maintaining the stimulus of an unnatural price level (which also acts adversely on demand). As a result, the maladjustment between supply and demand is usually not cured but in many cases is even aggravated, and ultimately the situation is forced back on natural conditions for its remedy.

Curtailment plans appear to have a legitimate place in our economy, provided they are used to supplement the law of supply and demand, and not to defy it. Properly conducted, they can be made to serve a valuable economic function. But if they are managed with the idea that economic tendencies can be ignored and higher prices can be attained than are justified by underlying conditions, they will prolong and intensify the period of adjustment. The dilemma, of course, is that producers see no point in exerting themselves to curtail unless they gain an early reward of better prices, and consequently it is usually contrary to human nature simultaneously to curtail and leave prices free.

It is of interest to note further that the rise of proration in the petroleum industry paralleled the most active phase of the development of the cartel system abroad and the advancement of plans in all parts of the world for price stabilization in a wide range of commodities. In fact the pervasiveness of this development was one of the characteristic features of the inflationary period that preceded, and gave rise to, the present depression. Indeed, at the risk of oversimplification, it may be said that the world depression had its roots in three causes—credit inflation, trade barriers, and price fixing devices—in respect to all three of which human effort attempted to run counter to basic economic principles.

Economic Consequences

Proration has been applied in the petroleum industry for over four years. Sufficient time has elapsed, therefore, for the consequences of proration to manifest themselves in observable form, and the results of this practice may now be examined and appraised. It should be made very clear, however, in order to avoid possible misunderstanding, that the results of proration are not ascribable so much to curtailment per se as to the particular manner in which proration has been conducted. Had any step in the application been different, the consequences would have likewise been modified. Much misunderstanding has arisen because of a confusion between the principles of proration and its mechanism of application.

The developments in the petroleum industry that have particularly characterized the period of proration, and with which proration may have a direct or indirect causal relationship, may be grouped under seven heads, as follows:

1. The price of crude oil has declined.
2. A huge invisible inventory has accumulated.
3. Overproduction of crude oil has been translated into the form of overextension of refining capacity and marketing facilities.
4. The high-cost producer has been in effect subsidized at the expense of the low-cost producer, with the result that the average cost of production has been raised thereby.
5. The principle of ratable takings has been established.
6. An increase in operating efficiency has taken place.
7. A liaison between the federal and state governments, on the one hand, and the petroleum industry, on the other, has been entered into, thus bringing the political factor into the administration of the petroleum industry.

It is apparent that the price of crude petroleum has drastically declined during the period of proration. It may be questioned whether proration has caused this decline, but it is obvious that proration has not succeeded in preventing a severe reaction in prices. What the character of the price movement would have been without proration cannot be accurately known, although it is safe to observe that the gradient of the decline has been influenced by proration. The fact that the depression had thus far affected oil consumption in relatively minor degree suggests that the depression has had a less important effect upon petroleum than upon most other commodities with respect to which artificial control has been attempted.

The economic pressure of the crude oil potential has had an unanticipated effect on the refining and marketing departments of the business. Unable to find direct outlets, because restricted by proration, the surplus crude has sought the market through indirection by stimulating the construction of additional refineries, which, in turn, called for the provision of supplemental marketing facilities. This process, as clearly shown by Swensrud, was facilitated by the growing integration of the industry, which provided direct conduits, so to speak, from the crude oil potential to consumer markets for gasoline. This process, however, built up so much congestion at the terminals of the movement that the companies, in addition to enlarging their own distribution facilities, engaged in the practice of offering wider and wider margins to dealers, thus drawing in outside capital and personnel which created a still greater proliferation of marketing outlets. Proration, therefore, by establishing a huge crude oil potential, set up forces that translated overproduction over into excess capacity in both refining and marketing. Unfortunately overcapacity is more dififcult to correct than overproduction.

The high-cost producer has apparently benefited from proration, for proration tends to give to the marginal operator a share of the market which he cannot command unaided. From a moral standpoint much can be said in favor of such an outcome, but the reverse is true on the score of economic considerations alone. Also, on the moral ground, little will have been gained if eventually the high-cost producer is wiped out; in such event his agony having merely been prolonged. Also proration has had the effect of protecting the surplus capital previously drawn into the industry, although it must be said that here, too, it has provided no ease for this increment and the final verdict must wait until all the evidence has accumulated. But whatever the particular outcome may be, it is clear that proration has proceeded under the avowed principle of allocating some of the market to all cost brackets; thus by subsidizing the high-cost producer and restraining the low-cost producer, as well as by stimulating the drilling of extra wells, proration has raised average costs and added a new interest charge to other operating burdens.

Archaic Law

An important advantage growing out of proration has been the establishment of the principle of ratable takings, which in effect is the recognition of the property rights that the courts have persistently denied since the inception of the industry in this country. It is generally known that the petroleum industry is fundamentally handicapped by a perversion of the common law in respect to oil and gas, with the result that the law of capture prevails and drilling in flush fields is not subject to price control. Proration, in a sense, is a defense mechanism against the destructive influence of the archaic law of oil and gas (as interpreted by the courts), and the wider recognition of the principle of ratable takings may be an important evolutionary step toward the formal adoption of unit operation. If this should prove the case, this element of proration is in the line of progress, even though by indirection.

Proration results in operation of wells under back-pressure at part capacity. It is well known, of course, that oil wells cannot be efficiently exploited at full capacity, hence the suppression of flush flow, brought about by proration, is a contribution to efficiency. This argument, however, loses some weight by virtue of the fact that the advantages are only a small part of those available under unit operation. Nevertheless it has come about that some fields, such as Yates and Hobbs, have been enabled by proration to simulate unit operation, to the benefit of operators in such areas. This aspect of proration should not be minimized.

Finally the difficulties inherent in the administration of proration have led to the development of a liaison between the industry and government, both state and federal. This move in the direction of socialization of the oil industry is an important phenomenon that brings the political factor to the front in the management of the business. The drift toward the integration of politics and proration has shown some intensification during the past year and raises problems of a new order with which the petroleum industry must cope.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 28)

Operators Royalty & Prod. Co.'s No. 2 Arnold, 330 ft. from S and W, Sec. 149, Blk. 3, I.&G.N. Sur. ..... Rig.
Pulse-Shell Pet. Corp.'s No. 1 Wright, 330 ft. from N and W of Sec. 13, Blk. 3, I.&G.N. Sur. ..... S.D. 2,659 ft.
Prairie Oil & Gas Co.'s No. 1 Pope, 330 ft. from N and E, Sec. 173, Blk. 3, I.&G.N. ..... Drlg. 1,910 ft.
Saunders et al's No. 2 Sullivan, 822 ft. from W and 321 ft. from NE. 160 ft. S, 264 ac. of N½, Sec. 136, Blk. 3, I.&G.N. Sur. ..... Will plug back to 3,275 ft. and shoot.
Skelly Oil Co.'s No. 24 Schaffer, 440 ft. from W, Sec. 172, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,140 ft.
Skelly Oil Co.'s No. 25 Schaffer, 330 ft. from S and E, Sec. 189, Blk. 3, I.&G.N. ..... Set csg. 1,150 ft.
Skelly Oil Co.'s No. 26 Schaffer, 330 ft. from S and W, Sec. 172, Blk. 3 I.&G.N. ..... Set csg. 1,156 ft.
Stanolind Oil & Gas Co.'s No. 2 Waggoner, 330 ft. from N and W, Sec. 172, Blk. 3, I.&G.N. ..... Drlg. 220 ft.
Sullivan & Ochiltree's No. 1-A Morse, 330 ft. S and W, N½ NE, Sec. 15, Blk. A-9, H.&G.N. Sur. ..... Fishing 2,880 ft.
Tarber's No. 1 Saunders, 330 ft. N and W, Sec. 3, Blk. 1, B.B.&S.F. Sur. ..... Location.

HUTCHINSON COUNTY

Baso's No. 1 Moore, 330 ft. from S and 330 ft. from E. in 80 ac. in NW, Sec. 21, Blk. M-21, T.C.R.R. Sur. .. Drlg. 400 ft.
Combination O. & G. Co. and Alspaugh's No. 1 Johnson, 330 ft. from S line, 330 ft. from E line of NW SW, Sec. 4, Blk. Y, A.&B. Sur. ..... Drlg. 510 ft.
Danziger O. & R. Co.'s No. 1 Johnson, 330 ft. N and W, SE, Sec. 34, Blk. Y, A.&B. Sur. ..... Spudded and S.D.
Deal O. & G. Co.'s No. 2 Sanford, 330 ft. N and E of N 80 ac., S 160 ac., Sec. 81, Blk. 46, H.&T.C. Sur. ... S.D. 450 ft.
Huber Prod. Co.'s No. 1 Johnson Bros. (Premier), 330 ft. N and E of W 60 ac., N 80 ac., NW, Sec. 3, Blk. Y, A.&B. Sur. ..... T.D. 3,116 ft; to plug back.
Pharis Oil Co.'s No. 5 Smith, 660 ft. from N and W, Sw, Sec. 14, Blk. Y, M.&C. Sur. ..... Rigging up standard tools.
Harry Stekoll's No. 1 Whittenburg, 1,650 ft. from N, 330 ft. from E, Sec. 89, Blk. Z, G.C.&S.F. Sur. ..... Drlg. 1,930 ft.
Sunburst Oil Co.'s No. 5 Smith, 660 ft. from N line, 660 ft. from W line of NW SW, Blk. Y, Sec. 14, M.&C. Sur. ..... Rig up.
Timms-Deatch's No. 4 Moore, 330 ft. N and W, Sec. 124, Blk. 4, I.&G.N. Sur. ..... Rig.

LIPSCOMB COUNTY

Okla. Public Service Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ..... T.D. 5,003 ft.

MOORE COUNTY

Canadian River Gas Co.'s No. 1-C Thompson, cen. of Sec., Blk. B-10, Sec. 2, E.L.R.R. Sur. ..... Location.
Dogie Oil Co.'s No. 1 Greenwald, 330 ft. from N and W, Sec. 277, Blk. 44, H.&T.C. Sur. ..... Shut down.
Interstate's No. 1 Nield, C NE, Sec. 18, Blk. 44, H.&T. C. Sur. ..... Rig up.
Magnolia Pet. Co.'s No. 1 Nield, 330 ft. from S and E of N½, Sec. 361, Blk. 44, H.&T.C. Sur. ..... Drlg. 2,645 ft.
Pollard et al's No. 1 Hall, 330 ft. S and E, NE, Sec. 131, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.
Sunray Oil Co.'s No. 2 Jones, 330 ft. N and W, W½ SW, Sec. 164, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.
Sunset Oil Co.'s No. 1 R. O. C. Brumley, 330 ft. from N line and 330 ft. from W line of SW, Sec. 360, H.&T.C. Sur. ..... Spudding.
Texas Interstate P. L. Co.'s No. 1-23 Thompson, C N½ NE, Sec. 23, Blk. 44, H.&T.C. Sur. ..... Location.
Texas Interstate P. L. Co.'s No. 1-37 Sneed, C NW, Sec. 37, Blk. 6-T, T.&N.O. Sur. ..... Location.
Texhoma Nat. Gas Co.'s No. 4 Coon "M," C SE, Sec. 103, Blk. 44, T.&T.C. Sur. ..... Drlg. 2,465 ft.

MOTLEY COUNTY

Matador Oil Corp.'s No. 1 Owens, C NE, Sec. 10, Blk. G, B.&B. Sur. ..... S.D. 520 ft.

OLDHAM COUNTY

Amalgamated German-American Oil Corp.'s No. 1 Norton, 330 ft. S and E, Sec. 12, T.&N.O. Sur. ..... S.D. 400 ft.
Chambers et al's No. 1 Herring, CNL, Sec. 20, Blk. 8, G.C.&S.F. Sur. ..... S.D. 3,535 ft.

PARMER COUNTY

Magnolia Pet. Co.'s No. 1 Wilson, 330 ft. from N and W, SE, Sec. 73, H. Kelly Sur. ..... Drlg. 3,718 ft.

ROBERTS COUNTY

Chicken Creek Oil Co.'s No. 1 Ledrick, 330 ft. N and W, Sec. 55, Blk. C, G.&M. Sur. ..... Drlg. 3,790 ft.
Travis et al's No. 1 Cunningham, 330 ft. S and W, Sec. 74, Blk. M-3, H.&G.N. Sur. ..... S.D. 2,650 ft.

WHEELER COUNTY

Clarity et al's No. 1 Porter, 330 ft. S and W, SE, Sec. 2, Blk. A-9, H.&G.N. Sur. ..... Drlg. 2,985 ft.
Devore & Robinson's No. 1 Sitter, 2,310 ft. from S and E of E½ of Sec. 33, Blk. 24, H.&G.N. Sur. ..... S.D. 2,193 ft.

SIR ARTHUR DUCKHAM DIES

Sir Arthur Duckham, pioneer in the industry of coal carbonization, died in London at the age of 52. He was director of aircraft production during the war and was well known in the United States.

New Rules Applied to Oklahoma City

Corporation Commission Also Appoints Ray M. Collins as Umpire for That Field on Petition of All Producers

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

Oklahoma continues to produce considerably less oil than its allowable, which was placed at 475,000 bbls. a day on January 1. The estimated daily average of the week ending February 20, was 413,565 bbls. which is an increase of 9,215 bbls. over the previous week. Operations in the State for the week ending February 20 were of little importance. Activity is believed to be increasing in Lincoln County. After a seismograph survey it is reported that several companies have been active leasing acreage in various parts of the county. The most active spots include Sections 3 and 24-14-3, Sections 1, 2 and 24-14-2, Sections 5, 6, 7 and 8-14-5, Sections 11, 12, 13 and 14-14-7, Sections 26, 27, 29, 30, 31, 32 and 36-15-2, Sections 7, 8, 17 and 18-15-2. It is also believed that some of the companies are still surrendering their wildcat acreage and reducing the rentals on other acreage in all parts of the State.

During the week the Oklahoma Corporation Commission issued new rules seeking to conserve the oil and gas production in the Oklahoma City Pool. These rules became effective February 16. The rules were recommended to the commission at the hearing held about a week ago, and some of the changes had been discussed at previous hearings.

One of the rules fixes the water level underlying the Wilcox sand at 5,330 feet below sea level, and it states that no wells shall be drilled below this depth without special permission from the chief conservation officer of the State. The order further states that no wells shall be completed until the hole has been measured by the district conservation officer to ascertain whether the water level has been penetrated.

Another rule permits the allowable production to be transferred or shifted from high gas-oil ratio wells, to wells with lower gas-oil ratio on the same lease, as a conservation measure. It was pointed out at the hearings that 75 or more wells in the field have a gas-oil ratio in excess of 10,000 feet of gas to 1 bbl. of oil produced, and that to continue producing these wells at the present rate will cause loss of 2,000,000,000 to 3,000,000,000 feet of gas energy. Such a transfer of the allowable production from one well to another will result in higher ultimate recovery, it was pointed out in the recommendations to the commission. Special allowables granted because of water intrusion may not be transferred from well to another it is held. Permission to make such transfer must be had from the field umpire.

The third rule and order issued by the commission fixes the shut down time factor, which at present is 65 days, plus the time required to make up the eight-hour initial flow. The 65-day shut down period is retained in the new order, which permits the taking of potential tests on either the first or second four-hour flow. The amount of oil in the initial flow is then charged against the well as overproduction, and is handled accordingly, as other overproduction. Special allowances are permitted for wells which have served part of their shut down time.

Ray M. Collins, Field Umpire

Ray M. Collins, state umpire, was named in a journal entry signed by three members of the Oklahoma Corporation Commission, as field umpire of the Oklahoma City Field. Resignation of the committee of three was accepted and the enforcement of the proration rules was taken over by Mr. Collins.

In the announcement of the change the commission said that the committee of three, composed of W. N. Stokes, C. O. Rison and B. G. Patton, had the thanks of the commission, who appreciated the work accomplished by them in directing the affairs of the Oklahoma City Field during the most chaotic history of the field. The committee served as umpires since the martial law shutdown was lifted on October 10.

Two petitions requesting the change were received by the Oklahoma Corporation Commission. The first was from a group of operators, headed by B. G. Patton. The second petition was filed by the operators' committee.

The change brings the united support, for the first time, of all the operators in the field in helping to enforce the proration rules of the commission, and gives Ray Collins support that the previous field umpires have not had. Although appointed by the commission as state umpire several years ago, Mr. Collins has not been in direct charge of proration in the Oklahoma City Field. Mr. Collins said that he would divide his time between the Oklahoma City Field and the other flush fields in the State and for the present there would not be any change in the personnel, or the operation of the proration rules.

March Allowables

Many of the operators in the Oklahoma City Field are looking forward to the Corporation Commission's meeting on February 25, when the new allowables will be fixed for the first half of March. Umpire Collins may suggest some changes in the field. Many do not believe the daily allowable for the first half of March will be increased but it is expected to be increased the second half. The pipe line companies and general purchasers make their nominations for 15 days in advance and the allowable is based on the market demands.

The Oklahoma City Field continues to be active with a total of 76 operations and new locations listed in the field. Of this number, 18 were drilling at the close of the week ending February 20; two were waiting to make production tests, one test was fishing, 27 were shut down, 13 were rigs, 9 tests were waiting for cement and 6 were locations.

200,000,000-Foot Gasser

The Corporation Commission issued orders during the week classifying the Springrose Drilling Co.'s No. 1 Henry, NE cor. NW NW Section 2-11-3w, and the Wirt Franklin Petroleum Co.'s No. 5 Lowery, NW cor. Section 12-11-3w, as gas producers. The Springrose Drilling Co.'s No. 1 Henry is estimated at 200,000,000 feet a day, but it has never been fully tested because of the sand cutting the connections. Several times the well cut out its connections threatening to blow wild.

Denver Producing & Refining Co.'s No. 1 Harrison-Smith has been given an adjusted potential of 14,523 bbls. a day. It is a recent completion.

The Corporation Commission has granted the Coline Oil Co. a permit to take a new potential production test on its No. 11 Clauer, SW of Section 25-11-3w. The last potential was taken on November 5, 1931; since that time the well has been put on the gas lift.

Phillips Petroleum Co.'s No. 2 Everest, NW cor. SE NW SE Section 15-11-3w, on Block 20 of Tappan Heights Addition, and the same company's No. 1 Garber, N half SE NE NE Section 22-11-3w, on Block 6 of Carney Heights Addition, were new locations in the southwest part of the Oklahoma City Field.

Potential production tests were taken on two wells in the Oklahoma City Field during the week, both being recent completions. Under the new rules, revising the shut down time on wells, new completions may take potential tests during their eight-hour flow.

Big Wells Continue

The Ocate Petroleum Co.'s No. 1 Smith, SE cor. NE NE NW, Section 15-11-3w, on the west side of the field, flowed 10,511 bbls. of oil in four hours. The well was given an adjusted potential of 21,022 bbls. of oil. Phillips Petroleum Co.'s No. 1 Dehn, NW cor. SW NW, Section 3-11-3w, flowed 14,862 bbls. of oil in four hours. It was given an adjusted potential of 29,724 bbls. of oil. The gas was estimated at 70,000,000 feet a day.

Will Test Cleveland County

The Tom Slick Oil Co. acquired a half interest in a block of 2,800 acres of leases in Township 10-1e, northeastern Cleveland County, from the Stanolind Oil & Gas Co. and Amerada Petroleum Corp. There is a contract for a test well to be drilled on the block, the contract being dated May 27, 1930, with an extension granted to November 5, 1931. The exact location for the test was not specified. The block consists of acreage in the SE Section 21-10-1, S half, Section 22-10-1, SW Section 23-10-1, all of Sections 27 and 28-10-1, the E half, Section 26-10-1, the N half, Section 33-10-1, NW Section 34-10-1, and the NW Section 35-10-1.

The block has been surveyed with a torsion balance and a seismograph and several parties of geologists have also worked in the area. Within tne block the royalty owners consist of Anderson-Prichard Oil Co., Equitable Royalty Co., Tom Slick Oil Co., Ingram Royalties Co. and Mayes Royalty Co.

In Lincoln County

Lincoln County is attracting considerable attention at this time with a wildcat test nearing the Wilcox sand and the announcement of a new location. Barnsdall Oil Co.'s No. 1 Taylor, C SW NW, Section 17-14-5, 6 miles east of the West Chandler Field, is believed to be logging high at its present depth. The test is now shut down waiting for cement after landing casing at 4,690 feet, and rigging up standard tools. The formations found were Sylvan shale at 4,553 feet, Viola lime at 4,638 feet. The formations are believed to be higher than reported in other tests drilled in the vicinity, but the top of the Viola lime was lower than generally found in producing wells in the West Chandler Field.

A new wildcat location was announced in Lincoln County during the week by

(Continued on Page 74)

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

Company, farm and location—	Remarks:
ALFALFA COUNTY	
Smith Brothers' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	S.D. 1,232 ft.
J. W. Bailey's No. 1 Acre, SW cor. NE Sec. 14-24-11w	S.D. 5,502 ft.
ATOKA COUNTY	
Edgerton Edwards' No. 2 Rowland, SE NE NW Sec. 6-1-15	Rig.
BECKHAM COUNTY	
Pattel Royalty's No. 1 Goose Tree, SW SE SW SE Sec. 32-10-23w	Rig.
Price-McFann's No. 1 Webster, C SW SW Sec. 34-8-26w	T.D. 2,344 ft.; plugged back to 1,890-1,900 ft.; 1,500,000 ft. gas.
Mid-Continent's No. 1 Schaff, C NE SW Sec. 22-11-22w	Waiting on cmt. to set 430 ft.
Mid-Texas Co.'s No. 1 Sidell, NE cor. SW SW Sec. 17-2-22w	S.D. 2,550 ft.
White et al's No. 1 Green, SW cor. Sec. 34-10-24w	S.D. 3,575 ft.
BLAINE COUNTY	
Washoma Oil Co. et al's No. 1 Phillips, C NW SW Sec. 13-19-10w	S.D. 5,115 ft.
CADDO COUNTY	
Abernathy & Brown's No. 2 Houston, Sec. 24-6-13w	S.D. 1,115 ft.
CHEROKEE COUNTY	
La Piere et al's No. 1 Woods, C SE SE Sec. 27-17-21	S.D. 1,504 ft.
COAL COUNTY	
Radial Oil Co.'s No. 1 McGraw, NE NW Sec. 2-1s-8	S.D. 1,450 ft.
Whitney et al's No. 1 Miller, SE NE Sec. 10-2-8	Drlg. 900 ft.
COMANCHE COUNTY	
G. W. Stogner's No. 1 Doebel, C SW SW Sec. 3-3-9w	S.D. 1,450 ft.
CREEK COUNTY	
R. F. Moore et al's No. 1 Gillam, NE cor. SW NW, Sec. 17-17-8	Drlg. 100 ft.
CUSTER COUNTY	
Miley Pet. Co.'s No. 1 Caldwell, NE, Sec. 12-14-14w	Location.
GARFIELD COUNTY	
E. L. Love et al's No. 1 White, SE cor. NW Sec. 9-24-6w	S.D. 5,850 ft.
GARVIN COUNTY	
Malarnee et al's No. 1 Phillips, NE SW SE Sec. 24-2-2w	S.D. 4,830 ft.
GREER COUNTY	
Dovell et al's No. 1 Capell, NW cor. Sec. 1-7-22w	5,000,000 ft. gas 1,455-65 ft., T.D. 1,760 ft.
French's No. 1 Murphy, SW NW Sec. 23-7-21w	S.D. 1,645 ft.
HASKELL COUNTY	
Ault et al's No. 1 Harrison, CWL SE NE Sec. 14-9-19	S.D. 650 ft.
Ault et al's No. 1 Hall, NW SW SW Sec. 14-9-19	S.D. 2,000 ft.
Ault et al's No. 1 Hall, SE NW Sec. 25-19-9	S.D. 200 ft.
Holden's No. 1 Phillips, SE cor. Sec. 3-9-18e	S.D. 1,860 ft.
Marion Oil's No. 1 Sanders, NW NE NW Sec. 10-9-18e	S.D. 2,387 ft.
KAY COUNTY	
Bluebaugh et al's No. 1 Indian, C NW NE, Sec. 30-25-1.	Rig.
Harris & Haun's No. 1 Watson, SW NW Sec. 28-28-1w	Drlg. 1,295 ft.
W. H. Atkinson et al's No. 1 Hayes, SE NE Sec. 24-28-3	Drlg. 3,015 ft.
Lewis et al's No. 1 Harris, SE NW Sec. 14-25-1	Location.
Mummert Drlg. Co. et al's No. 1 Cormick, C NW SE Sec. 9-27-2	S.D. 3,693 ft.
Blackwell Oil Co.'s No. 1 Harshman, Sec. 2-26-1w	Rig on ground.
KIOWA COUNTY	
Christian's No. 1 Jones, NE SE Sec. 8-7-18w	S.D. 820 ft.
LATIMER COUNTY	
P. English's No. 1 Unknown, NW SE Sec. 16-6-19	S.D. 1,542 ft.
LE FLORE COUNTY	
Dowd et al's No. 2 Thomas, SE NE Sec. 16-3-22	S.G. 1,194-1,248 ft.; shot with 40 qts., 1,000,000 ft. gas; S.D.

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Kansans Want Increase in Allowable

Effort Afoot to Have Production Increased to 130,000 Bbls. Central Western Counties Due for Exploration

By W. A. Spinney
Staff Correspondent, Kansas Fields

Bad weather slowed up development in Kansas during the past week, snow and rain making roads impassable in many sections of oil fields of the State. In some cases, drilling developments have been suspended entirely because of the impossibility of the workmen to reach the field. The starting of new wells has been delayed through the failure to move material to the locations.

The State's production was steady for the week ending February 20, when it was estimated the State made 98,980 bbls. of oil a day. The daily average increased 335 bbls. daily over the previous week.

New potentials in the Ritz-Canton-Decker Pool, in McPherson County, will be taken around the first of March. Umpire L. R. Pickrell estimates the field will show a potential of approximately 70,000 bbls. a day from the 52 chat wells and 72 Viola lime wells.

The Kansas Public Service Commission issued the order following its regular semimonthly oil hearing at Wichita. Following the formal session the commission recessed until the next day to permit the operators to discuss the manner and method of taking the new potentials and to make recommendations to the commission.

The chat well owners voted to take potentials based on 12 hours' production in the usual manner, the minimum per well to be 100 bbls. a day. The Viola well operators voted similarly except that a minimum of 50 bbls. per well was fixed. The question of whether 2½ or 3½-inch tubing is to be adopted universally in the field remained to be settled.

Activity in Ritz-Canton

The Ritz-Canton Field in McPherson County continues to be the most active area in the State. P. J. Breslin's No. 1 Flook, NE cor. NW Section 35-19-2w, was showing 15,000,000 feet of gas and 300 bbls. of oil per day from the chat formation at 2,905-61 feet. Tankage was being erected as the owners expect the well to start flowing when drilled a few feet deeper. The well extends production a half mile to the west, on the west side of the field. New locations have been made offsetting the well, one to the north by Vernon Oil Co. and one to the northeast by the Derby Oil Co. and others.

The semiwildcat test of F. A. Whan and others, No. 1 Dixon, NW cor. SW Section 7-19-2w, will resume operations in a few days. The test has been shut down at 1,200 feet. It is located about 3 miles west of the Decker gas field.

Another large Viola lime well was completed in the Ritz-Canton Field by the Syndicate Oil & Gas Co. and the same company expects to complete another in a few days. With the completion of these two wells it is estimated the company will have a potential of 4,200 bbls. a day. Syndicate Oil & Gas Co.'s No. 3 Becker, NW cor. E half SE, Section 36-19-2w, has been given a potential rating of 1,085 bbls. of oil per day from the Viola lime at 3,399-3,414 feet. Same company's No. 4 Becker, NW cor. SE SE, Section 36-19-2w, found the Viola lime at 3,397-3,419 feet and will be given a potential in a few days.

G. P. Dickey has made a location for No. 3 Decker, SW cor. NW SE, Section 35-19-2w. It is one location north of the same operators recently completed No. 2 Decker. No. 1 Decker was completed a few months ago for 6,722 bbls. a day, the largest well in the pool.

Darby Oil Co.'s No. 2 Kaegi, Section 20-19-1w, is a new location staked during the week. It will be the east offset to the Gypsy Oil Co.'s No. 1 McGill, a Viola lime well.

The test of Twin Drilling Co.'s No. 1 Farver, SW cor. SE, Section 16-20-1w, McPherson County, was cleaning out and preparing to drill deeper into the chat after fishing for a bailer. The top of the chat was found at 2,928 feet.

Want 130,000 Bbls. Per Day

A movement is on foot looking to an increase of daily average production to 130,000 bbls. at the next meeting of the Oklahoma, Kansas and Texas members of the Oil States Advisory Committee to be held in Tulsa, March 1.

Plans to ask for the increased daily allowable were announced by a member of the Kansas Public Service Commission. The daily average production of oil from the State has been under the present allowable for the last few months.

A. S. Ritchie, vice president and general manager of Derby Oil Co., Paul Jones of Lyons, a newspaper publisher, and Albert Sturn, of Bushton, a landowner, have been appointed by Chairman Hill of the Public Service Commission to attend the meeting. Production has been averaging from 1,000 to 3,000 bbls. a day under the present daily allowable.

Wildcatting in Central West

Many express the opinion the central western part of Kansas has a large potential production and wildcatting is expected to increase in this area with the coming of spring weather. There is every indication that the area now called the Barton or Ellsworth Arch will be the most active wildcat area in the State this year.

There are 25 or more producing completed wells along this area covering Stafford, Rice, Barton and Ellsworth Counties. The wildcat development is expected to spread to other western and southwestern counties. Some of this campaign is also expected in virgin territory where geophysical instruments have been used in surveys the last year.

The wildcat play will not be left to the independent operators but the major companies are expected to enter the campaign. Some of the larger oil companies have blocks of acreage in the central western part of the State and they are interested in searching for crude oil to provide a plentiful reserve for their refineries.

It has been recently reported that seismograph crews have been making a survey of the oil possibilities in Reno and Pratt Counties. Several years ago a core drill campaign was made in these counties and several other counties in the central part of the State. After this campaign several of the recently discovered pools were found.

Another important location was announced for a wildcat test along the Barton-Ellsworth Arch. The test is R. Gear and H. S. Downing's No. 1 in the SW cor. SE, Section 29-16-10w, Ellsworth County. The location appears to be favorably located from a geological standpoint. A survey of the area has been made with geophysical instruments by several major oil companies and all of the district is now under lease. The location is northeast of the production in the Stratman Pool, which has not yet been defined, the discovery well is located in Section 1-17-10w.

Two of the wildcat wells that were completed more than a year ago along the Barton-Ellsworth Arch are still without market outlets. These wells are shut in awaiting a pipe line connection. One of the largest wells yet completed in the area is J. H. Tatlock, Shell Petroleum Corp. and others' No. 1 Ploog, C SW SE, Section 33-18-9w, Rice County, which was completed in August, 1930, and is estimated at 4,000 bbls. a day, is still shut in. Another well completed more than a year ago is the Muth Brothers' No. 1 Beyers, NE cor. NW, Section 21-19-9w, Rice County, which swabbed 134 bbls. in eight hours is still shut in.

Rush County Gives Promise

Another county in the area that is due to be exploited is Rush County. In the eastern part of the county several large gas wells have been completed and Dewey & Mitchell's No. 1 Greenawalt, in Section 17-19-16w, is estimated from 200 to 400 bbls. of oil per day. It has been completed since last Sepember and shut in. The owners have completed a 2-inch pipe from the well to a loading rack near Shaffer, where the company expects to transfer the crude oil to the Stanolind Crude Oil Purchasing Co. to be shipped out in tank cars. The well is allowed to produce 200 bbls. a day. On a production test it made 212 bbls. of oil in 22 hours on a slow pumping stroke. The oil was found in the Silicious lime at 3,815-40 feet.

In Sedgwick County

Kansas is believed to have a potential of 145,000 bbls. a day from its present wells. Some of the fields that are now under proration have been curtailed since the first of the year but these areas are not expected to be curtailed after the increase in crude oil requirements expected in the spring. The Eastborough Pool in Sedgwick County, and the Voshell Pool, in McPherson County, were curtailed with the understanding that they would only be prorated for 60 to 90 days after January 1. Many believe if the recent request to increase the State's allowable to 130,000 bbls. a day is granted, the Public Service Commission will dispense with proration in the Eastborough and Voshell Pools.

Late reports from wells in Sedgwick County indicate that A. M. Scroggin's No. 1 R. Orchard, in Section 4-28-1, found water in the chat formation at 3,046-3,090 feet. The test is shut down with a hole full of water at 3,100 feet.

After ordering shutdown of F. Hollow's No. 1 Church Acre, in Section 20-22-3w, Harvey County, a wildcat well, the Public Service Commission has permitted the well to resume producing at the rate of 120 bbls. a day. The commission granted the well discovery rights which in this case amount to a recovery of 17,500 bbls. The potential of the well is estimated at 540 bbls. and the commission allows the well to produce 120 bbls. a day.

The first offset to the F. Hollow well was announced during the week, W. C. McBride, Inc.'s No. 1 in the NW cor. SW Section 20-22-3w, Harvey County. It is the only operation in the northwestern part of the county.

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WILDCAT OPERATIONS IN KANSAS

(Descriptions are East unless marked otherwise)

Company, farm and location—	Remarks:
BARTON COUNTY	
Skelton Oil Co.'s No. 1 Ott, C SE SE Sec. 16-19-14w	S.O. 3,225-28 ft.; 3,304-10 ft. wtr.; fishing 3,375 ft.
BUTLER COUNTY	
Ward McGinnis' No. 1 Bush, SW NE, Sec. 10-24-2	Spudding.
DICKINSON COUNTY	
Severe et al's No. 1 Lavengood, NE SW Sec. 13-13-2	S.D. 4,752 ft.
ELLSWORTH COUNTY	
R. Gear et al's No. 1 Sanberth, C SW SE Sec. 29-16-9w	S.D. 50 ft.
Alyward et al's No. 1 Stratman, SE NW SE Sec. 1-17-10w	Siliceous 3,255-71 ft.; 117 bbls. 2 hrs. shut in; estimated 2,000 bbls.; no pipe line connections.
Afladin Pet.'s No. 1 Stoddenberg, C SW Sec. 22-16-10w	Siliceous lime 3,332-47 ft.; estimated 1,500 bbls. a day; shut in.
FINNEY COUNTY	
National Ref. Co.'s No. 1 Wells, C SW Sec. 13-23-30w	S.D. 3,805 ft.
HARVEY COUNTY	
Liggett et al's No. 1 Davis, SW SE NE Sec. 7-24-1	S.D. 2,500 ft.
KINGMAN COUNTY	
Skelly Oil Co.'s No. 1 Miles, NE cor. Sec. 30-27-10w	1,635-40 ft., 2,000,000 ft. gas; at 2,005-20 ft., 6,000,000 ft. gas; at 1,133-42 ft., 3,000,000 ft. gas; showing oil 3,385 ft.; T.D. 3,504 ft.
Panhandle Drlg. Co.'s No. 1 Wetheral, C SE NW SW Sec. 20-28-10w	Fishing 100 ft.
McPHERSON COUNTY	
Twin Drlg. Co.'s No. 1 Farver, SW SE Sec. 16-20-1w	Drlg. chat 2,928-30 ft.; show gas.
Shell Pet. Corp.'s No. 1 Johnson, SE SW SW Sec. 35-19-3w	Top chat 2,984-3,007 ft.; 10,000,000 ft. gas and 300 bbls. oil; shut in.
MORTON COUNTY	
Hydraulic Oil Co.'s No. 1 State Land, NW SE Sec. 22-34-43w	T.D. 3,640 ft.; temp. abnd.
MORRIS COUNTY	
Kostle-Moseley & Hatfield's No. 1 Furney, NE SE Section 16-16-8	Rig.
Allender et al's No. 1 Wycoff, C SW SE Sec. 5-17-7	Abnd. 659-61 ft., wtr.
Urschel et al's No. 1 Bersuch, NW SE NW Sec. 10-17-7	Fishing 915 ft.
Hankerson et al's No. 1 Cessman, SW SE Sec. 24-16-9	S.D. 2,625 ft.
NORTON COUNTY	
Richards et al's No. 1 Colby, Sec. 17-4-21w	Rig.
OSAGE COUNTY	
Briggs & Smith's No. 1 Wood, SE NW Sec. 21-14-15	S.O. 2,190-2,200 ft.; S.D.
RAWLINS COUNTY	
J. G. Durham et al's No. 1 Weaver, SE cor. Sec. 3-3-35w	S.D. 3,925 ft.
Jarvis & Wright's No. 1 Rainbow, NW SE Sec. 33-32-7w	Location.
RICE COUNTY	
Gypsy Oil Co.'s No. 1 Steckel, C NE NW Sec. 31-19-10w	Drlg. 2,355 ft.
RUSSELL COUNTY	
J. Brennan's No. 1 Waly, CNL E½ NW Sec. 29-13-11w	Rig.
T. Palmer et al's No. 1 Pasek, C SE Sec. 3-14-11w	Drlg. 2,855 ft.
RUSH COUNTY	
Skelton et al's No. 1 Brock-Hartman, SW SE NE Sec. 4-18-16w	S.D. 50 ft.
SALINE COUNTY	
Twin Mounds Oil Co.'s No. 1 Wels, C W½ NE NW, Sec. 20-13-4w	S.D. 2,710 ft.
SHERIDAN COUNTY	
Flo et al's No. 1 Shoemaker, SE SW Sec. 27-7-26w	S.D. 4,120 ft.
STEVENS COUNTY	
Argus Prod.'s No. 2 Christopher, C NE Sec. 10-33-39w	S.D. 5,521 ft.
SUMNER COUNTY	
Trees Oil Co. and Shell's No. 1 Springate, NE SE SW Sec. 6-34-2	Drlg. by csg. 2,285 ft.
WASHINGTON COUNTY	
Sincox et al's No. 1 Penwell, NW SE NE Sec. 16-3-3	S.D. 1,720 ft.

Plan Play in Mississippi and Alabama

Geophysical Surveys Followed by Completion of Several Blocks Calling for Tests. North Louisiana to Resume Activity

By J. R. Crumpton
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Feb. 22.—An indication that this division will have much active wildcatting during 1932 came with the announcement during the past week of several large blocks being assembled in each of three different states. These developments, along with results obtained in a deep test in Sabine Parish, held the center of interest. The prediction that Mississippi would experience many wildcat explorations during the year has been substantiated by the completion of several large blocks in widely scattered sections of that State.

In Jasper County, near the town of Paulding, Thomas Harvey Robinson has completed a solid block of 16,000 acres in Townships 3 and 4n, Ranges 12 and 13e. The acreage was contracted on 10-year commercial leases with 50 cents per acre renewal and with a well to be drilled on the block during the first year. L. Spraragen made the geophysical survey and worked out the magnetometer high of the area on which the block is situated.

In Sharkey, Humphreys and Washington Counties, operations have already been started by the United Gas Public Service Co. on a 67,000-acre tract, located in Townships 13, 14 and 15n, Ranges 3, 4, 5, 6 and 7w. The test, No. 1 Lenhart, is located in Section 14-14n-6w, Sharkey County, and is now drilling at 165 feet. The block is also reported to be located on a magnetometer high, a very thorough geophysical survey having been made by another of the major companies several years ago. A renewal of around 25 cents per acre after the first year is incorporated in the contract on this block.

In Covington County, E. W. Pettus has assembled a block of 10,000 acres in Townships 8 and 9, Ranges 15 and 16w. The contract calls for a well to be drilled on the block within the year 1932. It is reported that Mr. Pettus is associated with Oklahomans in the enterprise.

To Test Alabama

Another interesting announcement on extensive wildcat activities in a virgin state comes from farther east in Alabama. This area has had desultory wildcatting for several years, but indications are that the state, particularly the southern part, will get several thorough tests during 1932. In Clarke County, the Magnolia Petroleum Co. has completed a block of 60,000 acres in Townships 10 and 11n, Ranges 2 and 3e. The company is paying the landowners a bonus of 25 cents per acre at the time the leases are signed, with a drilling clause calling for a well to be drilled on the block within two years. The block is located near the town of Thomasville, Ala., and is on a magnetic high worked out by the geophysical department of the Magnolia Petroleum Co.

Another block in Clarke County has been assembled by the Ramsey Petroleum Corp., with an obligation to drill a well by May 1, 1932. The block consists of 12,000 acres, located in Townships 5 and 6n, Range 2e, and on the Jackson fault, near the town of Jackson, Ala. Nearer the Gulf Coast, in Mobile County, in the vicinity of the city of Mobile, J. K. Kerr of the Ohio Oil Co. has completed a block of 10,000 acres in Township 3s, Range 2w. The contract on this block obligates the lessors to drill a well during 1932.

NORTH LOUISIANA

North Louisiana, usually the most active district in this division, has experienced a lull in wildcat operations during the past few months, but will again enter the active column with several wildcats to be drilled on large blocks. A 12,000-acre block in Townships 7 and 8, Ranges 9 and 10, located in Sabine and Natchitoches Parishes, has been completed by W. D. and H. W. Perritt. The contract calls for a 2,700-foot test to be started not later than May 1, and the operators have already staked a location, No. 1 Brown Lumber Co., in the SE. Section 6-7-10. This test is 6½ miles east of Zwolle East Field production, and the entire block is north and east of this field.

In DeSoto Parish, near the town of Grand Cane, Guy Warren has signed a contract to drill a 3,200-foot test, operations to begin not later than May 1. The block consists of 4,000 acres, and is in the vicinity of several wildcats drilled during the past two years, all of which had good showings of oil and gas.

Showing Northeast of Zwolle

The outstanding development in the drilling wells of this district during the week was R. L. Gay, trustee's No. 1-A Long Bell Lumber Co., Section 10-8-13, in Sabine Parish. This test, a wildcat about 6 miles northwest of the Zwolle Field, is one of two deep tests being drilled in that area. A 14-foot core was cut from 4,775-89 feet, 6 feet of which was recovered and which was classed as Oolitic, very honeycombed, limestone containing distinct showings and odors of oil. The formation is classed as the Glen Rose of the upper Trinity horizon from which highly saturated gas is produced in several areas of North Louisiana, including Sugar Creek and Rodessa.

The log of the well reveals that the top of the chalk was encountered at 1,632 feet, the top of the lower Cretaceous at 3,430 feet with the top of the Glen Rose at 4,204 feet. The Glen Rose from the top to the depth at which the core was taken has been mostly gray lime, very fossiliferous, and dark greenish shale. The operators are arranging to ream from 3,798 feet to the total depth, and set 6⅝-inch casing for a thorough test. The well is being drilled by R. L. Gay, pioneer operator of that area, and discoverer of both the Blue Lake and Zwolle Fields. Walter E. Cook of Paterson, N. J., is associated with Mr. Gay in his Sabine Parish operations, including the present deep test. H. D. Easton of Shreveport, the discovering geologist of the Zwolle chalk rock producing field, has analyzed all the cores from the present well and identified the formations. Mr. Easton has contended since the chalk rock production in Zwolle was discovered that a deeper pay existed in and around that area. He believes that the Trinity horizon carries pay potentialities, even more widespread than the chalk, which covers an area about 20 miles long and 1½ to 3 miles wide.

Mississippi Wildcats

The United Gas Co., of Houston, Tex., has started the drilling of a wildcat on a large structure in Sharkey County, Mississippi, about 6 miles west of the test drilled by the Danciger Oil & Refining Co. of Tulsa, over the line in Humphrey County.

The Danciger Oil & Refining Co.'s test is at present shut down at 3,014 feet.

The location of the United test is the CSL, Section 14-14n-6w, Sharkey County.

Completions

There were only seven completions reported in the division, all of them in North Louisiana, two oil producers, one gas well and four dry holes. In Caddo Parish, the Shreveport Oil Corp.'s No. 2-B Muslow, Section 32-21-15, was completed as a 50-bbl. pumper from 1,625 feet. This well was drilled to a total depth of 2,135 feet, tested dry and was plugged back to the former depth in chalk. The other producer was from the Zwolle Field, Eddie Self's No. 3 Jacobs, in the SE cor., Section 1-7-11, swabbing 75 bbls. daily from a total depth of 2,518 feet. The well was a disappointment as it was an offset to the north of Smitherman & Grigsby's No. 1 Gardner, a good flowing well after being out of the producing column for several weeks. The United Gas Public Service Co.'s No. 1-B Alice Purvis, Section 34-17-6e, had an initial gauge of 12,132,000 feet with 910 pounds rock pressure from 2,441 feet.

All of the dry holes were reported from Zwolle as follows: O. J. Baird's No. 1 Duggan, Section 14-7-11, dry and abandoned at 2,600 feet; Roy Baker's No. 1 Sabine Lumber Co., Section 11-7-12, failed to pump as a commercial well and was abandoned at 2,548 feet; O. A. Gautier's No. 1 Mischell, Section 30-8-12, dry at 2,599 feet; A. F. Tarver's No. 2 Cutrer, Section 12-7-11, was abandoned at 2,550 feet after failing to pump commercially.

Daily Average Runs

There was a net decrease of 265 bbls. in the daily average runs from the fields of North Louisiana and Arkansas during the week. Daily average runs from the several pools were:

NORTH LOUISIANA	
Caddo, light	5,505
Caddo, heavy	2,020
Cotton Valley	490
DeSoto-Red River	1,980
Elm Grove	335
Haynesville	4,740
Holly	335
Homer	2,940
Pleasant Hill	325
Sarepta-Carterville	860
Urania	3,150
Zwolle	5,815
Total North Louisiana	28,495
Total previous week	28,725
Decrease	230
ARKANSAS	
Champagnolle	1,800
El Dorado	3,060
Lisbon	570
Nevada	1,220
Smackover, light	2,940
Smackover, heavy	22,900
Stephens	660
Urbana	350
Total Arkansas	33,500
Total previous week	33,535
Decrease	35
Total both states	61,995
Total previous week	62,260
Decrease	265

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Rotary operations unless otherwise designated)

NORTH LOUISIANA

AVOYELLES PARISH

Company, farm and location— Remarks:
Stauffer & Eshleman's No. 1 Caruth, Sec. 40-1n-7e ..... Derrick.

BOSSIER PARISH

Andrews & Davlin's No. 1 Nattin, 100 ft. N, 250 ft. W, C, Sec. 15-22-14 ..... W.O.S.R. 2,890 ft.
Dr. W. N. Hankin's No. 1 Newell, 300 ft. S and W, NE cor., Sec. 12-19-11 ..... T.D. 1,885 ft.
H. I. Morgan's No. 1 Strange, Sec. 23-19-11, 660 ft. N and E, SW cor. ..... Drlg. 1,767 ft.

CADDO PARISH

Calatex O. & G. Co.'s No. 1 W. B. Hudson, Sec. 8-16-16, 2,640 ft. E, 2,865 ft. NW cor., Sec. ..... Set 10-in. 80 ft; drlg. 250 ft.
Louana O. & G. Co.'s No. 1 Hammock, Sec. 32-19-6, 660 ft. N and W, SE cor. ..... Drlg. 1,555 ft.

CALDWELL PARISH

Carter Bell's No. 1 Taylor, 150 ft. S, 150 ft. E, NW cor. NE SE, Sec. 17-14-4 ..... S.D. 1,100 ft; high wtr.
Hudson et al's No. 1 Burton, Sec. 35-12-2e ..... S.D. 2,950 ft.

CATAHOULA PARISH

National Drlg. Co.'s No. 1 Marsh McMiller, 70 ft. N, 100 ft. W, C, Sec. 26-9-6 ..... T.A. 3,097 ft.

DESOTO PARISH

E. T. Oakes' No. 1 R. H. Bryant et al, 200 ft. N and W, SE cor. NE NW, Sec. 30-13-15 ..... Coring red shale 3,176 ft.
Rellitt Oil Co.'s No. 1 Ganno hrs., 300 ft. S and E, NW cor. NW NE, Sec. 12-11-16 ..... S.D. 1,965 ft.

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LOUISIANA-ARKANSAS PROVEN AREAS

NORTH LOUISIANA

CADDO PARISH—PINE ISLAND

Company, farm and location— Remarks:
Shreveport Oil Corp.'s No. 2-B Muslow, 1,000 ft. S, 300 ft. E, NW cor., Sec. 32-21-15 ..... Completed for 50 bbls. 1,625 ft; (plugged back).
Simplex Oil Co.'s No. 1 Youree-Glassell, 500 ft. N and E, C, Sec. 13-20-15 ..... S.D. 2,275 ft.

MOREHOUSE PARISH

Southern Carbon Co.'s No. 57 fee, Sec. 9-20-4e, 660 ft. N, 1,317 ft. E, SW cor. ..... S.D. high water 948 ft.

OUACHITA PARISH

Carbon Cons.' No. 7 Guthrie, Sec. 50-20n-4e, 5,263 ft. N, 7,475 ft. W of cors. of Secs. 25, 26 and 49, in Sec. 50 ..... Location.

RICHLAND PARISH

United Gas Public Service Co.'s No. 1-B Alice Purvis, Sec. 34-17-6, 81 ft. N, 599 ft. W, of center of Sec. .. Completed for 12,132,000 ft. gas 2,441 ft.

SABINE PARISH—ZWOLLE

Pelican Nat. Gas Co.'s No. 11 La. Long Leaf Lbr. Co., Sec. 10-7-11, 330 ft. N and W, SE cor. NE NW ..... W.O.S.R. 2,592 ft.
Smith et al's No. 1 Hale, Sec. 1-7-13, 330 ft. S and W, NE cor. NW SE ..... Tested dry; arranging to deepen 2,446 ft.
A. F. Tarver's No. 2 Cutrer, Sec. 12-7-11, 330 ft. S and W, NE cor. NW NW ..... Abd. 2,550 ft.
O. J. Baird's No. 1 Duggan, Sec. 14-7-11, 328 ft. S, 648 ft. E, from C of Sec. ..... Dry and abd. 2,600 ft.

(Continued on Page 65)

Two Disappointments in Pettus Field

Increased Activity in Escobas District. Northern Duval County Test Starting. Prospect of Shallow Pool in Zavala County

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Feb. 22.—There were two disappointments in the Pettus Field the past week, or near disappointments. Slick-Seeligson, Inc.'s No. 4 Ray, a north offset to Houston Oil Co.'s No. 3 Portis, at 3,909 feet tested 16 fourbles of mud and no oil. No. 3 Portis got the sand at 3,907-12 feet and made about a 500-bbl. well, and is the farthest east producer in the new extension pool. Slick-Seeligson's No. 4 Ray is coring deeper and has a chance but there did not seem to be much hope.

In the middle of the new extension area J. M. Davis' No. 1-B Ray at 3,952 feet was fixing to get a test of a sand but the hole is about 50 feet deeper than the producers in the field and also has a lower elevation to start with, so it looked at the time rather discouraging. There is a half mile of territory between the nearest production at the east end of the extension and that at the west end. About the middle of this Weinert drilled his No. 1 Ray, a dry hole, and Davis' No. 1-B Ray is a little east and south of the Weinert test. It made things look as though there were two separate producing spots.

Houston Oil Co. was below 2,000 feet late last week, and should be nearly to the sand by the time this is read, in its No. 4 Portis which is 500 feet east of No. 3 Portis and 500 feet east and 300 feet south of Slick-Seeligson's No. 4 Ray which tested mud and no oil.

Bee County

Some little interest was created in Bee County several miles southeast of Beeville when Humble and Hurlburt's No. 1 Wood, drilled over a year ago and abandoned at 5,077 feet at which time it was plugged and capped, was opened up and threw a stream of oil into the derrick. It had shown some gas at 4,221 feet when drilled and had a year in which to accumulate pressure. It had a sand also at 5,020 feet but failed to get a good drill stem test of it.

Escobas Pool

In the Escobas Pool in Zapata County S.R.C. Oil Co. got a 300-bbl. well as a southwest offset to Daniel & Hill's No. 1 Montemayor in the second sand which came in for 1,500 bbls. S.R.C.'s No. 6-D Montemayor, a south offset to the Daniels & Hill test, came in at the same rate of 1,500 bbls. and at the end of 24 hours went to salt water. S.R.C.'s No. 7-D Montemayor is a west offset to it and a southwest offset to Daniels & Hill and it came in for 300 bbls. No. 6-D Montemayor has been plugged and is standing. It was thought it went a little too deep. The total depth is 1,482 feet and cost of drilling is light. It costs about $2,200 to drill the hole and the company may decide to drill a 10-foot offset rather than work to bring No. 6-D back. The company is drilling No. 8-D Montemayor, a west offset to the Daniel & Hill test, and will likely wait till it is completed before deciding what to do with the other.

Operators in the northeast Zapata County district are showing a tendency to work off to the east and southeast of the Escobas Pool and also for a south extension. Black & Williams have bought a lease from Alworths in the southeastern corner of the Comitas grant and are to drill a test which will line up with the Martinez Pool, 10 miles north, and the Fansler and Shankle gas wells half way between. These are on a line about 2½ miles east of the Escobas Pool. Last week Brogan & Belcher in the southeastern part of the Comitas grant and a little west of the Black & Williams location cored a sand at 1,680 feet in Block 62 of the Douglas Subdivision of the Zorro ranch and were fixing to make a drill stem test.

D. M. Shaffer has gone about a mile south of the nearest production in the southern end of the Escobas Pool and is starting a test in Block 56 of the Douglas Subdivision of the Zorro ranch in the Comitas grant. The idea is to pick up an extension. The southern end of the Escobas is producing from the second sand which is the best paying of the two sands.

Low cost of drilling in Zapata County producing areas, due to shallow depth and easy digging, with no proration except the Sunday shutdown, fairly good production and a demand for the oil is attracting a number of wildcatters to the district who are looking for extensions or new pools.

A couple of years ago Fansler brought in a gas well about 2 miles east of the Escobas Pool and at about the time the Escobas Pool was discovered. Not much development followed. It was pure wildcat at the time. Shankle later drilled another gas well a little south of it. Gas is nearly always lying at one side and oil at the other in the Laredo district and now there is a campaign to pick up oil around the Fansler gasser. K. & M. Oil Co. (Herb Morgan) is starting a test a half mile east of Fansler in Block 13.

Northern Duval County

Duval Oil Corp. is starting No. 8 Bishop Cattle Co. in northern Duval County 660 feet east of its No. 1. One well in this field on an adjoining lease is flowing 900 bbls. and has produced 200,000 bbls. in 10 months at total depth of 2,384 feet and the success of operators in this pool, which has not yet been extended to its limits, has attracted attention to that part of Duval County. A test is to be drilled a few miles north of the field in wildcat territory. Magnolia Petroleum Co.'s No. 1-B Duval Land Co., in Survey 96, 6 miles due north of the field, failed to make a well in the sand at 1,820-27 feet though it showed about 1,000,000 feet of gas and drilled deeper. It may be an edge proposition and would seem to warrant making a new location and drilling another test. It is on acreage that came to Magnolia with the merger of Vacuum and Standard of New York and is 6 miles east of the S.R.C. Pool which was brought in on Vacuum geology.

Live Oak County

Jacob, Buzzini & Pickett have abandoned their No. 1 Brewer in northwestern Live Oak County at 1,309 feet but have not abandoned the lease and have encouraging evidence they may bring in a shallow field a few miles north of the Calliham Field in McMullen County. They got 32 cores and ran three drill stem tests on No. 1 Brewer and had 3,000,000 feet of gas at 427-34 feet and a gas and oil showing along with salt water in sand at 885-950 feet and again at 1,085-1,175 feet. The thickness of these sands is taken into consideration and some additional tests will be drilled at once.

Zavala County

There is prospect for another shallow pool in southwestern Zavala County. Carpenter and others' No. 1 Wood at 757 feet is in sand from 731 feet with a 3-foot break of rock at 735-38 feet. Casing was first set without cementing and it failed to hold. It has been cemented and the hole will be tested this week. When it drilled into the sand it blew out and showed for a considerable volume.

Kerr County

Evans & Gant's No. 2 Love in southwestern Kerr County is underreaming casing to lower it to the bottom of the hole to shut off the water that is coming in and will drill another 500 feet. The total depth is 5,849 feet and drilling in the Mississippian formation.

George Ball has the rig on the ground for a test 3 miles north of Kerrville in the eastern part of Kerr County.

Lease blocks in Southwest Texas are now being taken largely on the per cent plan. No checkerboard acreage is being sold. Interests thus far are being taken largely by independents but wells are drilled and a per cent of the interest in the deal is sold which guarantees a unitized block in case a well is completed as a producer. In some recent deals majors have taken protection acreage in blocks and probably will continue to do so in some instances but there is a drift among the independents to finance their propositions in such a manner as to control the block in its entirety in case production is found. Several have lately been put over in that way.

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

ARANSAS PASS

Company, farm and location—	Remarks:
Big Lake Oil Co.'s No. 1 Giesecke on St. Joseph's Island	Abnd. loc.

ATASCOSA COUNTY

American Central Oil Co.'s No. 2 Mary McConnell, 150 ft. W of E line, 300 ft. S of No. 1, Blk. 138, W. C. M. Baker Sur., 3 miles W and 6 mile S from Somerset	T.D. 1,665 ft.; drlg.
Glen Mathis' No. 2 Mrs. C. Martin, 100 ft. SE of No. 1	T.D. 2,980 ft.; preparing to resume.

BLANCO COUNTY

Hardy-Sitton's No. 1 McMillan	T.D. 602 ft.; S.D.
Theo. Hick's No. 1 Specht, 1,500 ft. from S line, 500 ft. from W line of farm, in Thomas M. Fowler Sur. No. 27 in extreme south point of county	T.D. 1,650 ft.; S. D.
Liles Adams et al's No. 1 Luders, 150 ft. to S line, 1,420 ft. to E line of James Stanford's No. 155	T.D. 1,100 ft.; standing.

BASTROP COUNTY

E. R. Mart's No. 2 Wm. Bahn, 2,000 ft. from E line, 1,300 ft. from S line of farm in James Sandifer Sur.	Spudded in, S.D. for repairs.
Sun Oil Co.-Humble Oil & Ref. Co.'s No. 1 Powers, 400 ft. of N and E lines of Blk. 197, Bastrop town tracts	T.D. 3,050 ft.; drlg.

BELL COUNTY

Bridwell et al's No. 1 Nichols, 150 ft. to W and N lines of farm, N. Roberts Sur.	T.D. 425 ft.
Bridwell et al's No. 1 G. A. White, 550 ft. to E line, 150 ft. to S line of farm, Nancy Roberts Sur., 4 miles SE from Belton	T.D. 537 ft.; no report.
W. A. Klecka's No. 1 W. W. Thornton, 500 ft. from N line, 1,058 ft. from E line of tract in R. Roberts Sur.	Location.
J. W. Riley's No. 1 W. S. Chaffin, in M. Griffin Sur.	T.D. 365 ft.; S.D.
Jas. Scroggins' No. 2 Warrick, Ingram Sur.	T.D. 1,432 ft.; S.D.

BEE COUNTY

Alexander et al's No. 1 McFall, 3 miles S Skidmore	T.D. 2,100 ft.; standing.
Humble O. & R. Co.'s No. 1 Laura Thompson, 6,360 ft. from N line, 15,100 ft. from W line of tract in Garrett Roache Sur., S part of county	T.D. 5,310 ft.; S.D.

BEXAR COUNTY

Amsden-Ingersoll-Miller's No. 1 Strumberg, 450 ft. to W line, 1,020 ft. to N line of tract, 12 miles SW of San Antonio	T.D. 597 ft.; drlg.

(Continued on Page 62)

SOUTHWEST TEXAS PROVEN AREAS

ECKERT POOL—BEXAR COUNTY

Company, farm and location—	Remarks:
Williams et al's No. 2 Strunk, Juan Montez Sur.	Dropped.

PETTUS POOL—BEE COUNTY

Buck Oil Corp.'s No. 3 Ray, 175 ft. from W line, 150 ft. from N line of lease in John Williamson Sur.	T.D. 2,050 ft.; drlg.
J. M. Davis et al's No. 1-B Ray, 150 ft. to N and E lines of 10-ac. lease, next south of Weinter's, John W. Williamson Sur.	T.D. 3,932 ft.; coring.
J. L. Mauldin's No. 2 fee	Rigging up in SW cor. of lease.
Slick-Seeligson, Inc.'s No. 4 Ray, N offset to Houston Oil Co.'s No. 3 Pettus	T.D. 3,982 ft.; reaming to set csg.
Slick-Seeligson, Inc.'s No. 5 Ray, 300 ft. E of No. 3 Ray	Spudded in.
Slick-Seeligson, Inc.'s No. 5 Ray, 300 ft. E of No. 3 Ray in George A. Kerr Sur.	Spudded in.
The Texas Company's No. 4 Gremmel	Making location.
The Texas Company's No. 5 Gremmel	Making location.

COOKSEY POOL—BEXAR COUNTY

Chiquita Oil Co.'s No. 3 Cooksey, 480 ft. from E line, 330 ft. from S line of tract in J. W. Rialls Sur.	Location.

ECKERT POOL—BEXAR COUNTY

F. H. Eckert & Son's No. 9 Sandemer, 150 ft. to N and W lines	Location.
F. H. Eckert & Son's No. 10 Sandemer, 400 ft. E of No. 9.	Location.
F. H. Eckert & Son's No. 8 John J. Brehm	T.D. 682 ft.; comp. 8 bbls.
F. H. Eckert & Son's No. 1 Louis Brehm, W offset to No. 3 John J. Brehm	Location.

SALT FLATS POOL—CALDWELL COUNTY

Joe Bruner's No. 1 Malone, 150 ft. to N line, 750 ft. to W line of tract, A. Floyd Sur.	T.D. 2,704 ft.; standing.
John Storey's No. 1 Dickerson, 150 ft. to N of center of S line of tract, John R. Rains Sur.	Rigging up.

COLE POOL—DUVAL COUNTY

Cole Petroleum Co.'s No. 75 Benavides, 365 ft. from NE line, 150 ft. from NW line, Blk. 8, Sec. 18, Mariana Arispe grant	T.D. 2,400 ft.; drlg.

GOVERNMENT WELLS—DUVAL COUNTY

Duval Oil Corp.'s No. 8 Bishop Cattle Co., 660 ft. E of No. 1 in Sur. No. 135	Rigging up.

DARST CREEK POOL—GUADALUPE COUNTY

Humble Oil & Ref. Co.'s No. 3-C Denman, 600 ft. NE of No. 2-C Denman, 700 ft. from W line of lease	Spudded in.

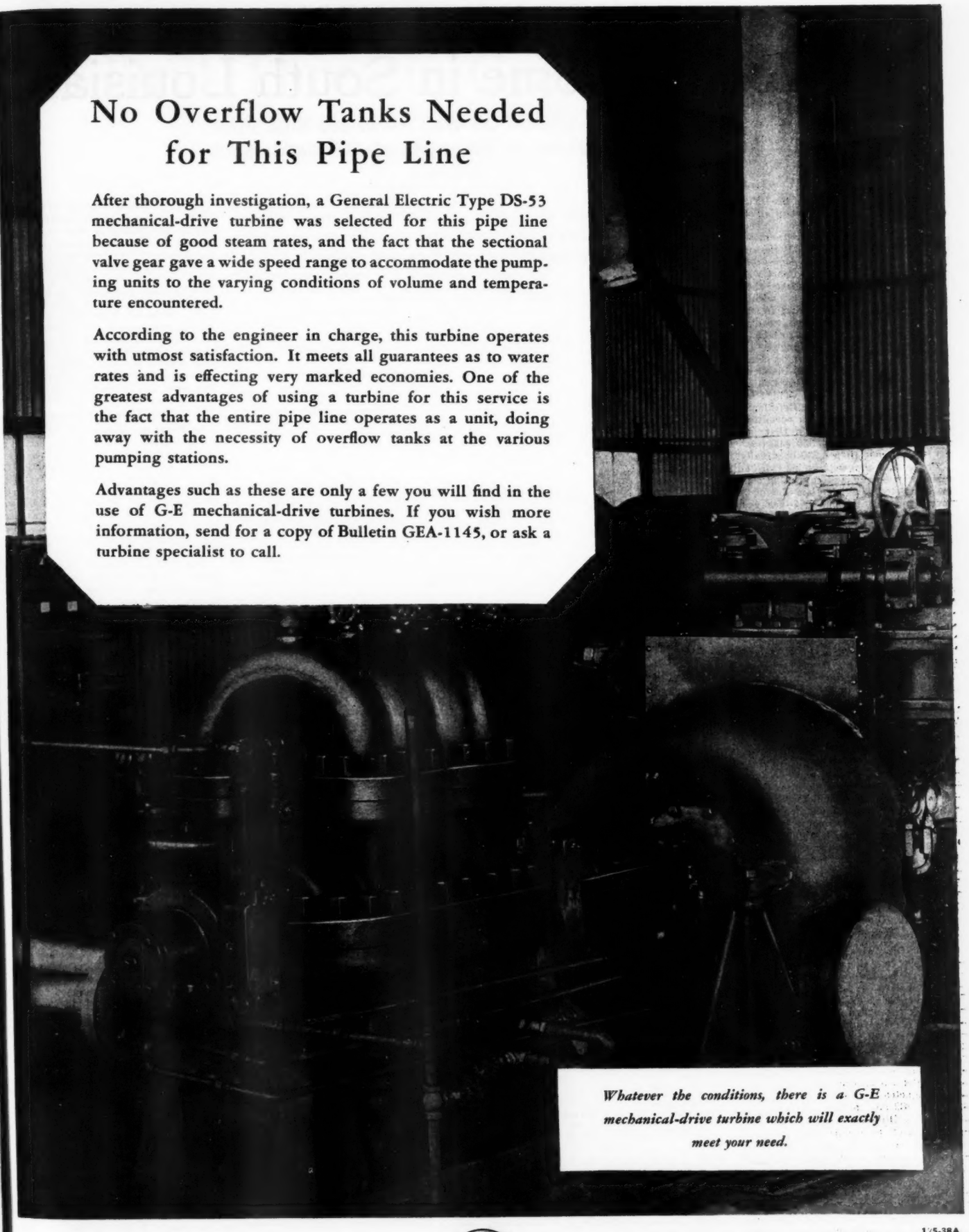
(Continued on Page 62)

No Overflow Tanks Needed for This Pipe Line

After thorough investigation, a General Electric Type DS-53 mechanical-drive turbine was selected for this pipe line because of good steam rates, and the fact that the sectional valve gear gave a wide speed range to accommodate the pumping units to the varying conditions of volume and temperature encountered.

According to the engineer in charge, this turbine operates with utmost satisfaction. It meets all guarantees as to water rates and is effecting very marked economies. One of the greatest advantages of using a turbine for this service is the fact that the entire pipe line operates as a unit, doing away with the necessity of overflow tanks at the various pumping stations.

Advantages such as these are only a few you will find in the use of G-E mechanical-drive turbines. If you wish more information, send for a copy of Bulletin GEA-1145, or ask a turbine specialist to call.



Whatever the conditions, there is a G-E mechanical-drive turbine which will exactly meet your need.

1/5-38A

GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Big Well on Dome in South Louisiana

Most Easterly Coastal Oil Well Flows 300 Bbls. First Hour of Typical Heavy Gravity Crude. In the Marshes

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Feb. 22.—Further proving up of extensive potential oil reserves which are believed to exist around the newer salt domes of the Gulf Coast was accomplished the past week with the bringing in of the second good producer on the Lake Washington (Lake Grand Ecaille) Dome, Plaquemines Parish, Louisiana. This well, Humble Oil & Refining Co.'s No. 7 Cockrell-Moran, was permitted to flow only one hour but in that period made between 300 and 350 bbls., or at the rate of more than 8,200 bbls. daily.

At present the well is shut in until tubing can be run and cannot be classed as completed. Production during the hour's run was through 9⅝-inch casing and a 2¼-inch line without chokes. When completed it will be held to a restricted flow.

Like the discovery well (No. 4 Cockrell-Moran), No. 7 Cockrell-Moran is producing from the shallow cap rock at 1,163-74 feet. It has no screen in the hole but has the 9⅝-inch casing seated at 1,163 feet. The well came in and started running over the top after the bailer was run only eight times. The oil in No. 7 is the same as that found in No. 4, which was 19.1 gravity at a temperature of 85 degrees and is the typical heavy oil of all cap rock fields in the Gulf Coast.

Lake Washington is located in the marshes in the extreme southern edge of Louisiana only a few miles inland from the Gulf of Mexico and is the most easterly of coastal fields. It was discovered by geophysical exploration in 1928 and is one of the few cap rock producing fields which have been discovered since the early days of Spindletop, Humble, Batson, Hull and such old domes. The first test at Lake Washington was started late in 1929 and eight in all have been drilled. Two of these were deep tests drilled in exploration for flank sands while the other six have been shallow. All operations have been by Humble Oil & Refining Co. although Gulf Refining Co. and Shell Petroleum Corp. are joint owners with Humble.

New Well at Barbers Hill

Sinclair Oil & Gas Co. got a producing well on the east side of Barbers Hill in a sand at a total depth of 4,881 feet where a shallow sand play is under way. This well, No. 9 Wilburn, flowed 440 bbls. daily through a half inch choke, 3 per cent of the fluid being salt water and sulphur water. Mills-Bennett Production Co. failed to get its No. 6 Wilburn back on production after working it over and resetting screen. The latter well created considerable interest when it was completed the middle of January flowing 1,280 bbls. daily opning new possibilities for Oligocene production by finding this sand at comparatively shallow depth high up on the dome underlying the salt overhang. Although at a total depth of 5,024 feet, the same sand, previously developed in a line of wells skirting the edge of the dome, has been at 5,200-5,400 feet. The Bennett well is several hundred feet in from those wells and also on the inside of a line of 4,400-foot Miocene sand production, which is being developed there.

The Texas Company's No. 6 Wilburn, completed last August as the discovery well of the 4,400-foot Miocene sand play on the east side of Barbers Hill, has quit flowing and now has been rigged up to deepen to the Oligocene sand found by Mills-Bennett Production Co.'s No. 6 Wilburn. Present depth of the well is 4,509 feet, where screen is being cut and pulled.

Of particular interest at Barbers Hill will be the drilling by Mills Bennett Production Co. of a test located high up on the dome on the extreme south side. Location for this test, No. 1-B Gulf fee, was made the past week and a rig now is up. It is in what was looked upon up to the discovery of the salt overhang two years ago as condemned territory, and is well within the line of deep production in that area and also on the inside of a number of old shallow holes, quit when they topped the cap rock and salt. So far no test in that immediate vicinity has made any attempt to drill through the cap rock and salt.

Surprise at Markham

At Markham, Matagorda County, Deering & Newman's No. 1 Myers, located on the northwest side of the dome, a test drilled in 1929 by West Production Co. and abandoned as dry at 4,788 feet, blew out late in the week making considerable gas and mud. At latest report it still was blowing wild. The test recently was taken over by the present operators to rework and while drilling in sidetracked hole at 3,960 feet the gas was encountered.

The Texas Company's No. 2 Belcher, located southeast of the same company's No. 1 Belcher, discovery producer of the Manvel prospect, northern Brazoria County, went into the sand the past week at a total depth of 5,572 feet and in a two-minute drill stem test showed dry gas with pressure of 1,500 pounds. A small amount of oil was taken out in the bottom joint. Operators have been undecided whether to set casing and test or go deeper. The well is somewhat lower than No. 1 Belcher, which is producing oil from the sand at 5,493 feet.

At Lake Pelto, Terrebonne Parish, Louisiana, The Texas Company's No. 5 State has been swabbing at the rate of 1½ bbls. of 28.8 gravity oil per hour from sand at 1,733-65 feet. So far the well is not completed. This dome is one of seven of geophysical domes which The Texas Company is developing simultaneously in that parish.

The latter company has abandoned its No. 8-B State, located in Calcasieu Lake on the east side of the East Hackberry Dome, Cameron Parish. The test went into cap rock at 3,312-18 feet. This is the eighth of a series of tests which have been drilled in that immediate vicinity by The Texas Company and the Louisiana Land & Exploration Co. (The Texas Company took over the development from the Louisiana Land & Exploration Co., which drilled the first three). Of the eight, one, No. 3-B, made a good producer in sand at 3,941 feet, but all the others have gone into the cap and have been abandoned.

Drill 600-Bbl. Well Deeper

Humble Oil & Refining Co. is drilling deeper in its No. 1 Hooks, a semiwildcat on the south side of Pierce Junction, which was completed several weeks ago in a sand at 3,894 feet as a 600-bbl. well. The well, which had been set in that sand with a one-string casing and screen job, eliminating the necessity of pulling screen, at latest report was in another sand at 5,040 feet showing oil.

Yount Lee Oil Co. has resumed drilling in its No. 10 Houssierre-Latrielle, deep test southeast of Jennings, Acadia Parish, after running 5-inch casing to 8,640 feet to protect a heaving hole. Present bottom of the hole is 8,650 feet, which lacks less than 100 feet of equaling the depth reached in that area by The Texas Company's No. 5 Rayne heirs, which was abandoned at 8,730 feet. The latter is the deepest test ever drilled at Jennings and the second deepest on the Gulf Coast.

GULF COAST FIELDS AND WILDCATS

Week Ending February 20

BARBERS HILL—CHAMBERS COUNTY

Company, farm and location—	Remarks—
Bashara Oil Co.'s No. 2 Tarbutton, Henry Griffith League, 25 ft. W of Texas Gulf Producing Co.'s No. 2 Tarbutton	Drlg. anhydrite 1,280 ft.
R. E. Ferrell's No. 2 Wilburn, Henry Griffith League, 215 ft. W of No. 1 in center of 45-acre tract	Drlg. rock 1,780 ft.
Gulf Prod. Co.'s No. 7 Wilburn, Henry Griffith League, 177 ft. W of No. 6	Drlg. salt 2,343 ft.
McAlbert Oil Co.'s No. 5 Wilburn, Henry Griffith League, 375 ft. of No. 4	Drlg. hard lime 1,398 ft.
McAlbert Oil Co.'s No. 3 Wilburn (W.O.), Henry Griffith League	Cutting and pulling screen 5,217 ft.
Mills Bennett Prod. Co.'s No. 1-B Gulf fee, Wm. Bloodgood Sur., 500 ft. E and 50 ft. N of SW cor. of "B" lease	Rig.
Rio Bravo Oil Co.'s No. 2 Fisher (W.O.), W. D. Smith Sur., 50 ft. out of NW cor. of tract	T.D. 5,390 ft.; drlg. sidetracked to sand and shale 3,806 ft.; set screen; bailing.
Sinclair Oil & Gas Co.'s No. 9 Wilburn, Wm. Hodges Sur., 50 ft. N of S line and 550 ft. W of No. 6	Set 140½ ft. of 5-in. screen 4,881 ft.; comp. flowing 440 bbls. fluid, 3 per cent salt and sulphur water, 200 lbs. pressure, ½-in. choke.
The Texas Company's No. 6 Wilburn (D.D.), Henry Griffith League	Cutting and pulling screen 4,509 ft.
The Texas Company's No. 8 Wilburn, Henry Griffith League, 25 ft. W of No. 5 and 50 ft. N of S line of tract	Drlg. shale and lime 3,406 ft.
Texas Gulf Producing Co.'s No. 1 Scott, Fitzgerald, 125 ft. from S line and 71 ft. from E line of Strip No. 1, Henry Griffith League	Drlg. salt 1,434 ft.
Texas Gulf Producing Co.'s No. 9-B Kirby, Henry Griffith League, 50 ft. out of SW cor. of J. M. Fitzgerald 50-acre tract and 110 ft. S of N line of Kirby tract	Drlg. salt 2,036 ft.
Texas Gulf Producing Co.'s No. 9-H Kirby, Henry Griffith League, 87 ft. W and 130 ft. N of No. 8-H	Shale and lime 4,906 ft.; drilled out 9⅝-in. plug 4,808 ft.

HUMBLE—HARRIS COUNTY

J. E. Burt et al's No. 1 C.O.&G. Texas Co. fee (D.D.), J. B. Stevenson Sur.	Pulled liner and screen 1,973 ft.; drlg. sticky shale 2,030 ft.
J. E. Burt et al's No. 2 C.O.&G.-The Texas Co. fee, J. B. Stevenson Sur., 450 ft. N of No. 1	Location.
Sun Oil Co.'s No. 27 Bender, W. B. Adams Sur., 250 ft. W of No. 26 in line with No. 25	No report.
E. M. Wilson's No. 8 W. & P. Gulf fee, 95 ft. from W line and 86 ft. from N line of Blk. 15, J. B. Stevenson Sur.	Drlg. 1,202 ft.

PORT NECHES—ORANGE COUNTY

The Texas Company's No. 1 Polk-Kuhn-Glass, 260 ft. E and 1,545 ft. S of SW cor. Marshall Beaucham Sur., in the T. J. Notgrass Sur.	Drlg. shale 5,866 ft.
The Texas Company's No. 2 Polk, T. J. Notgrass Sur., 500 ft. NE of No. 2 Polk	Rig.
The Texas Company's No. 3 Kuhn, 587 ft. S and 150 ft. W of NE cor. of the Mary E. Hall Sur. No. 2	Drlg. sand and boulders 915 ft.

HULL—LIBERTY COUNTY

Eclipse Oil Co.'s No. 1 Barrow, Jesse DeVore Sur., 50 ft. from N line and 31 ft. from E and W lines 37-acre tract	Drlg. shale 2,137 ft.
Republic Prod. Co.'s No. 145 Dolbear, Jesse DeVore Sur., 200 ft. SE of No. 85 and 200 ft. N of No. 61	Spudded.

PIERCE JUNCTION—HARRIS COUNTY

Anderson & Plummer's No. 4 Whitehead (W.O.)	T.D. 4,521 ft.; sidetracking in rock 3,365 ft.
Gulf Prod. Co.'s No. 9 Cain, Jas. Hamilton Sur. No. 98, 150 ft. N of No. 20 Taylor and 290 ft. E of W line of Cain lease	Drlg. gumbo 1,640 ft.
Humble Oil & Ref. Co.'s No. 1 Hooks (D.D.), James Hamilton Sur. No. 52, 904 ft. N of SW cor. along W line of lease and 396 ft. E at right angles	Coring oil sand 5,040 ft.
Navarro Oil Co.-Texas Exp. Co.'s No. 16 Dooley (W.O.), J. Hamilton Sur., 50 ft. from W line and 487 ft. from S line tract	T.D. 5,535 ft.; abnd.
Pure Oil Co.-Moody Rece'ver's No. 3 Herman, Jas. Kopman Sur., 200 ft. due W of C of E line of 25-acre tract	Tentative location.
Rio Bravo Oil Co.'s No. 21-A Settegast (D.D.), J. Kopman Sur., 400 ft. S and 200 ft. E of NE cor. "A" lease	Drlg. sticky shale 4,551 ft.
Rio Bravo Oil Co.'s No. 23-A Settegast, Jos. Kopman Sur. No. 44, 1,375 ft. S and 200 ft. W of NE cor. "A" lease	Drlg. hard, sandy lime 1,605 ft.

RABBS RIDGE—FORT BEND COUNTY

Cullen & West and Gulf Prod. Co.'s No. 3 George, John Rabb Sur., 1,000 ft. due E of No. 2	Sand showing oil 3,220 ft.; cmtd. 3,150 ft.; shut down for high water.
Cullen & West and Gulf Prod. Co.'s No. 1-B Lockwood & Sharp, John Rabb Sur., 300 ft. N and 300 ft. W of NW cor. of George tract	Standing 4,925 ft.
Gulf Prod. Co.'s No. 1 T. R. Booth, Samuel Kennedy Sur., 475 ft. N of S line of Booth 475-acre tract, due N offset No. 1 Booth-Meyers	Rig.

HIGH ISLAND—GALVESTON COUNTY

Yount Lee Oil Co.'s No. 24 Cade, 1,010 ft. from NE line and 1,250 ft. from NW line of N. Fitzsimmons Sur.	T.D. 5,497 ft.; cmtd. to 5,472 ft.; comp. flowing 525 bbls. fluid, 3.8 per cent b.s. and water, ¼-in. choke.
Yount Lee Oil Co.'s No. 25 Cade, N. Fitzsimmons Sur., 100 ft. due W of No. 23	Set 47¾ ft. of 5-in. screen 5,257 ft.; comp. flowing 240 bbls. P.L. oil on open line; T.D. 5,321 ft.

(Continued on Page 66)

To Drill Three in Greasewood Field

Craig Dome Wildcat Has Another Flow of Gas. Geary Dome, Wyoming, Test Proves Failure. New Operations in New Mexico

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Feb. 22.—The Midwest Refining Co.'s No. 11 State, in the southeastern part of the Hobbs Pool, was completed and given a potential of 14,761 bbls. per day. The California Co. is again active in the Eunice Pool. One new operation was started in the Jackson Pool in Eddy County and another in Dona Ana County, near the Texas line.

Contracts calling for the drilling of three wells on the Platte Valley Petroleum Co.'s acreage in the Greasewood Field in Colorado probably will be signed in a few days. The Ohio Oil Co.'s wildcat on the Craig Dome in northwestern Colorado encountered another flow of gas at 2,781 feet. O. H. Shoup and associates are planning a pre-Pennsylvanian test in Kiowa County.

In Wyoming, the Midwest Refining Co.'s Geary Dome test was a failure and is being abandoned. Agreement for the operation of the Big Sand Draw gas field as a unit has been signed. Portland, Ore., interests have qualified to operate in Wyoming and are reported to have acquired a refinery at Billings, Mont., to handle its Garland Dome production.

There were no completions or new operations reported in Montana or Utah.

NEW MEXICO

Lea County

The Midwest Refining Co. has one of the best completions in the Hobbs Pool for some time in its No. 11 State, C NE NW, Section 4-19-38, in the southeastern part of the field where the only drilling since last summer has taken place. It was given a potential of 14,761 bbls. daily. The total depth is 4,175 feet and 3-inch tubing was run to 4,150 feet. Same company's No. 8 Byers, C NW NW, Section 3-19-38, is drilling at 3,561 feet in anhydrite. It topped the brown lime at 2,810 feet and had the first gas at 2,870 feet. Midwest's No. 8 Turner, C NW SW, Section 34-18-38, in the New Hobbs townsite and a south offset to its No. 29 Turner, one of the largest wells completed in the southeastern part of the field, is rigging up.

Continental Oil Co.'s No. 6-B State, C SE SW, Section 33-18-38, an offset on the north to Midwest's No. 11 State, is shut down at 3,971 feet waiting for cement to harden. The 7-inch was cemented at this depth with 350 sacks. It will be an early completion.

In the Eunice area, the California Co. has gone back into its No. 1 Meredith, SE cor. NE, Section 19-21-36, has cleaned hole to bottom at 3,954 feet and is preparing to core. This well was completed about a year ago in the pay at 3,880-3,950 feet and made 225 bbls. of oil and 607,000 feet of gas the first 24 hours.

The test to the northwest of the Hobbs Pool to be drilled by Baker Oil Co., Inc., in the SW cor. NW, Section 16-13-33, is expected to get under way shortly. President R. M. Baker is due in Roswell this week to arrange to set the derrick stakes. The contract, which calls for a 5,000-foot hole, has been let to the Aladdin Drilling Co.

Eddy County

A new operation in Eddy County was reported in Grayburg Oil Co.'s No. 3 Burch, C SW NW, Section 19-17-30, in the Jackson area, which is rigging up. It is an offset on the north to same company's No. 2 Burch, which was completed in August, 1929, at a total depth of 3,204 feet with an initial production of 45 bbls. per day of 36 degrees gravity oil.

Leonard & Lever's No. 6 State, C NW, Section 28-17-29, which gauged 1,700,000 feet of gas at 2,325 feet, was deepened to 2,343 feet and completed as a 1,500,000-foot gas well.

Flynn, Welch & Yates' No. 61 State, SE NE NW, Section 32-18-28, Artesia area, is drilling at 1,900 feet in lime. It reduced the hole to 6⅝-inch at 1,865 feet, where the top of the lime was encountered

R. D. Compton's No. 1 Compton, NE NW NE, Section 8-18-27, is drilling at 1,080 feet in lime.

DeBaca County

Matador Oil Co.'s No. 1 Wood, NE SW SW, Section 6-4n-20, Salada Creek, is bottomed at 3,500 feet in red sand and preparing to resume after cementing the 5-$\frac{5}{16}$-inch at 3,495 feet.

Landowners Oil Co.'s No. 1 McAdoo, SW cor. NE, Section 16-1s-27, Buffalo Creek, is ready to resume at 4,670 feet in brown lime after installing new drilling line.

Dona Ana County

A new operation in Dona Ana County is reported in Middle States Oil & Gas Co.'s No. 1 Boretzi, SW cor., Section 14-26s-5e, which spudded and shut down until authorization to drill can be obtained from the Department of the Interior. The location is northwest of the town of Newman and 3 miles north of the Texas boundary. It is close to the pipe line of the Western Gas Co. which runs from El Paso westward into Arizona.

COLORADO

Weld County

Negotiations for the drilling of three wells on the holdings of the Platte Valley Petroleum Corp. in the Greasewood area are reported nearing a conclusion and the signing of three contracts within a few days is considered probable. The locations of the proposed wells or the identity of the companies that will drill them has not been released, but it is understood they will be drilled to the east of the producing wells. One most likely will be on the Niles tract, comprising the E half of Section 13-6n-61. The W half of Section 13 is held by the Continental Oil Co. and its No. 1 Briggs, C SE SW, is the best producer in the field. The Platte Valley company dug cellar and slush pits last fall for No. 1 Niles in the C SW SE, Section 13, but it is understood this location will be abandoned, although it is a direct east offset to the Briggs well, and that the new location will be farther east. The purpose will be not only to test the limits of the field farther east, but to avoid drilling close offsets. Heretofore wells have been spotted one to each 40 acres, but it has been found the drainage is greater than expected and it is desirable to have wider spacing. It is expected the Continental company will drill the Niles lease.

The Platte Valley company served notice on the Reiter-Foster Oil Co. this week that it was not complying with some of the provisions of the contract between the two companies. An officer said, however, that it was not a notice of cancellation. The Reiter-Foster company drilled two wells, No. 1 Ida Johnson and No. 1 Johnson-Juhl, on Platte Valley leases and started a third in its No. 1 Wilson, C NE SE, Section 24-6n-61, which has been shut down at 440 feet for the past month on account of lack of water. It is reported the question involves the drilling of this well and that the company will contend it has been impossible to go ahead for lack of a water supply. No. 1 Ida Johnson was completed last fall as a producer. It is understood the Platte Valley company has not transferred a half-interest in the Ida Johnson lease to the Reiter-Foster company under their joint contract, the Reiter-Foster company not having yet asked for the transfer.

Continental Oil Co.'s No. 1 Gadbois, C SE SW, Section 24-6n-61, on the southwestern edge of the pool, is bottomed at 6,701 feet and cleaning out at 6,664 feet. An attempt was made the past week to shoot the sand with 40 quarts. One shell was lowered to bottom and another was a short distance above. The third shell exploded at 6,573 feet, necessitating a cleaning out job. It is supposed, but not definitely known, that the shell at the bottom was also discharged. In the nine days ending February 11 the well produced 389 bbls., an average of 43.3 bbls. per day, all by swabbing except the first two days when it flowed 65 and 35 bbls. The sand at this location was only 20 feet thick against 36 feet in No. 1 Briggs.

Reiter-Foster Oil Co.'s No. 1 Johnson-Juhl, C SE SE, Section 14-6n-61, which found water in the Dakota, half a mile to the west of No. 1 Briggs, plugged off the Dakota with 60 sacks and then swabbed the hole dry. A little water then came in and it was decided to recement.

Kiowa County

O. H. Shoup, former governor of Colorado, and associates are reported to have blocked 35,000 acres on the Arlington, or Inman structure in the Haswell district in the southwestern part of Kiowa County and propose to drill a 5,500-foot well to test the pre-Pennsylvanian. The block mainly is in Township 19s, Ranges 52 and 53w, where a northward plunging structural nose is reflected in the surface rock. A pronounced magnetometer high was mapped, the highest point being in Section 13-19-53. About 15 miles to the northeast of this point the Mineral Exploration Co. made a test in the NE, Section 31-18-15, with a diamond drill in 1926. This test found the top of the Dakota at 1,173 feet, where it had a show of oil and water. At that time it was said the Dakota at that location was at the highest elevation above sea level at which it had been found in eastern Colorado. In 1926, the Nee-No-Shie Oil Co. abandoned a test in the NW SE, Section 18-20s-46, running out of hole at 4,090 feet, about 700 feet below the red beds. This well had several shows and cut a bed of salt at 1,803-2,013 feet. It topped the first Dakota at 710 feet.

Arapahoe County

MacDeb Drilling Co.'s No. 1 Fitzsimmons, NE, Section 7-4s-66, near Aurora, is bottomed at 5,920 feet in sandy shale showing a little oil and gas and is running a string of 4¾-inch pipe. The casing was on the racks last June, but was not run on account of the condition of the hole. Since then it has been cemented and straightened and cleaned out and is now reported in good condition.

Jefferson County

Ruby Hill Oil & Gas Co.'s No. 1 Bra-

(Continued on Page 74)

LETHBRIDGE TEST INDICATES FIELD OF SOME MAGNITUDE

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Feb. 20.—On the Lethbridge structure, southern Alberta, Texas-Imperial's No. 1, LSD 14, Section 22-8-22w4, has cemented 8⅝-inch on top of the oil sand encountered just below the Ellis-Madison contact at 4,551 feet. When the strike was made, the oil is reported to have forced itself to the surface through 3,000 feet of water. It is a brown crude between 31 and 33 gravity, similar to the shows encountered in Parco Oil Co.'s No. 1, some 37 miles to the southeast, and Hudson's Bay Oil & Gas Co.'s No. 1 Keho, some 17 miles to the northwest. All three tests encountered their oil shows in the same horizon just below the Ellis-Madison contact, which indicates a potential oil field of considerable magnitude.

Texas-Imperial's No. 1 will probably be drilled into production early next week, if the water shutoff tests satisfactorily. The drill did not go far enough into the sand to give much indication of potential production.

The three tests in this area which have successively encountered oil in the same horizon are strung along a northwest and southeast line starting close to the international boundary and passing a little west of Lethbridge. Parco Oil Co.'s No. 1, LSD 16, Section 34-1-20w4, on the Twin River structure, is about 35 miles south and 12 miles east of Texas-Imperial's No. 1. It got the oil show in the Madison between 3,870 and 3,890 feet, the highest point. Texas-Imperial's No. 1, about 37 miles northwest of Parco's No. 1 in an air line, got its show at 4,551 feet; while some 17 miles further northwest, Hudson's Bay's No. 1 Keho, LSD 2, Section 17-11-22w4, got the same horizon and the oil sand at 4,920 feet. Thus the same horizon is present over a distance of about 55 miles with the dip toward the northwest. The discovery presumably indicates the accumulation of oil in a rather extensive local field superimposed on the broad Great Plains fold east of the Rocky Mountain foothills. The oil showings encountered in these wells have apparently no relation to the heavy crudes encountered some years ago in the Skiff Field, farther east.

Two Other Tests

Owing to a variety of drilling difficulties, neither Hudson's Bay's No. 1 Keho, nor Parco Oil Co.'s No. 1 have yet been definitely tested for production, though all three wells are reported practically ready to drill in, and may get their definite test almost simultaneously.

Texas-Imperial's No. 1 was the last active test carried on by Imperial Oil, Ltd., in the Alberta fields. The test was jointly financed by Texas Oil Co. and Imperial Oil, Ltd., with drilling operations in charge of the latter company. Acreage in the Lethbridge area was originally secured some years ago by Lethbridge Leases, Ltd., which sold a portion to Lethbridge Petroleum Co. and turned over some on a royalty basis to Benton Oils, Ltd. Benton Oils, Ltd., subleased on royalty to Imperial Oil, Ltd.,

(Continued on Page 69)

California Production Now Stationary

Likely to Continue at Present Level for Some Months, as Excepting Kettleman and Others Curtailed, Most Fields Are in Settled Stage

By L. P. Stockton
Staff Correspondent, California Fields

LOS ANGELES, Calif., Feb. 20.—Crude oil production in California did not show any great change during the week as daily production is still hovering around the 500,000-bbl. mark and it appears probable will continue at the present rate for several months unless something unforeseen develops. There is very little prospect the gas conservation law will exert any appreciable effect on production of crude oil in the immediate future especially since this law is applicable only in flush fields or in areas where the waste of natural gas has reached substantial proportions. Injunction proceedings involving Santa Fe Springs operators does not go to trial until May 9, and while the outcome is of extreme importance because it involves the correlative rights of all operators in the common pool, it will not have any immediate effect on crude production.

Action to eliminate the waste of natural gas at Kettleman Hills will be resumed in the Superior Court at Hanford February 29, but even though operators are enjoined from producing in excess of a reasonable gas oil ratio this should not have any great effect as it will result only in the closing in of several wells producing from the Elliott high pressure zone. The gas oil ratio of wells producing in the Elliott horizon average approximately 34,000 feet of gas to each barrel of oil, while representative wells producing from the lower or Ochsner zone show an average gas oil ratio of about 3,000 feet of gas to each barrel of oil. There are four wells producing from the Elliott high pressure zone in the North Dome at Kettleman Hills and 19 producing from the Ochsner horizon. Production of the Elliott zone approximates 4,950 bbls. of 59.0 gravity oil per day compared with a production of about 55,000 bbls. of 38.0 gravity oil per day from the deep, or Ochsner zone.

In view of the partial breakdown in the existing curtailment program and because of the probability that the gas conservation law will not exert any substantial effect on production of crude oil, California must rely on the Sharkey oil conservation law for any relief to be had during the current year. The Sharkey bill, which E. B. Reeser says in his report to Governor Rolph "is the only tangible hope available to stop the drift toward distintegration of capital investment of companies operating exclusively in the older producing fields of the state," will be voted upon at a special election to be held in conjunction with the California primary election on May 3, 1932. Even though this bill is ratified at the special election it will require several weeks to put the machinery in motion. State production should not show any great change unless there is a further breakdown in the curtailment program.

The Oil Producers Sales Agency, which ratified the Sharkey oil conservation bill a few months ago, took another poll of its directors recently to determine the position which the agency should take with respect to the bill. All but one of the agency's directors favored the Sharkey bill. It was subsequently decided to obtain a vote of all individual agency members and a questionnaire asks members "(1) are you in favor of the Sharkey bill, Senate bill No. 362, passed by the legislature in 1931, being put into effect through the referendum vote on May 3, 1932, and (2) if you do not favor the Sharkey bill becoming a law, what measures do you suggest for balancing the supply and demand of oil in California, so that producers may have a market for their oil at a fair price?"

The opinion that production in California will continue at approximately its present level during the next few months is supported by the fact that with the exception of Kettleman Hills and a few other fields where production is being held in restraint either by curtailment or elimination of drilling, most California fields are in the settled stage and should continue declining at a normal rate. Production of the Ventura Avenue Field is expected to be gradually cut to approximately 35,000 bbls. per day as soon as the winter demand for natural gas is lessened and additional minor reductions are expected to be effected in other fields by major companies. Operators in the Elwood Field of Santa Barbara County effected a drilling moratorium a few months ago and exploitation of the deep virgin Sespe horizon is wisely being retarded until the posted price for this quality of oil is somewhere in line with its intrinsic value from a refining standpoint.

Production of the Dominguez and West Coyote Fields where small but consistent drilling has been going on for the past few months is being stringently curtailed. As a matter of fact, the production of these two fields has been running lower than the prescribed current allotment. On February 15 the Dominguez Field, with an allowable daily production of 13,620 bbls. was producing only 12,473 bbls. per day, while the West Coyote Field, with an allotment of 8,500 bbls. per day, was producing 8,268 bbls. daily. Long Beach, Playa Del Rey and Santa Fe Springs are the only fields which are producing greatly in excess of their respective maximum allowables. Several other fields are exceeding their maximum allotments but in practically every instance the overage is relatively small. Long Beach early this week was producing approximately 20,000 bbls. per day in excess of its maximum, while Playa Del Rey and Santa Fe Springs showed excesses of 6,500 bbls. and 9,750 bbls. per day respectively.

Long Beach

The Chiksan Oil Co. recompleted No. 1 Riedman in the Long Beach Field early in the week and it was returned to production pumping 485 bbls. of 24.3 gravity oil per day. Some difficulty has been experienced in developing consistent production as the well has a little too much gas to pump and not enough to result in a sustained flow. By frequent agitation the company has succeeded in increasing the production to approximately 1,000 bbls. per day and production has been holding at approximately this rate for two or three days. No. 1 Riedman was bottomed at 5,102 feet and finished with a 4½-inch liner carrying 705 feet of perforated. The Ring Petroleum completed No. 3 Zenith early in the week but this well, finished at 8,582 feet, failed to respond to swabbing operations and it is being rigged up to pump. M. A. Cox has recompleted No. 1 Grant-Miller pumping 155 bbls. of 28.1 gravity oil cutting 20 per cent. This well, which was taken over a short time ago from the A. H. MacFarland Syndicate, was plugged back from 5,857 feet to 5,194 feet and the 5¾-inch perforated from 4,850 feet to 5,050 feet. There are only 10 incompleted drilling projects under way in the Long Beach Field and since there is very little new work being started there will probably be only two strings of tools in operation at the end of another month or so.

Dominguez

There were no completions in the Dominguez Field during the past week, but it is quite probable that one well will be put on production some time during the next 10 days. This project is No. 101 Reyes of the Shell Oil Co. which is rotating in the pay at 4,619 feet. If this well comes in on schedule it should show the largest production of any well completed in the Dominguez Field since the resumption of work several months ago. It is showing exceptionally well and started to flow at the rate of 2,500 bbls. per day during a water shutoff test. The oil produced during the one-hour flow tested 32.5 degrees and at the end of the hour the oil showed practically no cut. The Associated Oil Co.'s No. 1 DeFrancis should follow No. 101 Reyes into production within a short time and will be followed by Union's No. 28 Callender and No. 18 Hellman unless mechanical trouble holds up drilling.

The Smith Petroleum Co. is drilling an interesting project in the Lawndale Field and the outcome will be watched with interest due to the costly drilling campaign which was carried on in the adjacent town lot section. This work resulted in the drilling of approximately 100 dry holes and resulted in the completion of only a few wells, none of which in the town lot section proved commercially profitable. The well now being drilled by the Smith Petroleum is west of the town lot area and is sufficiently close to production to justify the expectation of production. It looked rather promising a week or 10 days ago but has subsequently drilled into a gray sand at 6,170 feet and there is some question whether this might not be water bearing. The company thinks enough of the outlook to start work on a new well, however, but will not be spudded in until after the completion of the well now being drilled.

Inglewood

The Allison Syndicate is making preparations to conduct another production test on its No. 1 Moynier in the Inglewood Field, following a recement job on the 6⅝-inch at 5,452 feet. This well tested wet a few weeks ago with bottom of the hole at 6,108 feet, above which some rather promising looking oil sand was logged. The crew has been bailing for 24 hours, but it has not yet been determined whether the fluid removed is being replaced by either oil or water. The Baldwin Hills Syndicate is making preparations to land a string of 8⅝-inch casing in No. 1 Sentous following the coring of a promising looking oil sand at 4,108 feet. This well may necessitate drilling of several wells if it results in commercial production. The Baldwin Hills Oil Co. has just completed rig construction for No. 9 Brownmoor, a new well, which will be spudded within 10 days. No. 9 Brownmoor is much more favorably located with respect to structure than either No. 1 Moynier of the Allison Syndicate or No. 1 Sentous of the Baldwin Hills Syndicate.

Playa Del Rey

The Playa Del Rey Field, which was one of the primary causes of the disruption of refined oil prices on the Pacific Coast last spring, is relatively quiet as there are only two incompleted drilling projects under way. Both wells should be given production tests in the near future. While the status of these wells is being determined the Union Oil Co. will be making preparations to drill a new well on the Del Rey lease. This is rendered necessary because of lease requirements which stipulate both the amount of work to be done and the minimum amount of royalty payments monthly. The company has been obliged to pay the minimum monthly royalty for the privilege of retarding development in conformity with the curtailment program.

The Standard should finish three new wells on the Murphy Coyote property in the West Coyote Field within 30 days and these will be augmented by the completion of No. 50 Emery, another well which is drilling at 3,950 feet. Rig construction has been started for No. 51 Emery but with this exception the Standard has no further plans for additional development in this field. It is likely that additional wells will be drilled in this field during the current year as this work is being done to fulfill requirements. Several new wells have been finished during the past six months by the Standard but in practically every instance they have been shut in immediately.

New Standard Wildcat

The Standard Oil Co. has started road construction to facilitate the transportation of drilling equipment for a new wildcat to be drilled on Santa Rosa Island, approximately 35 miles south of the Santa Barbara coast line. The Standard's first wildcat on Santa Rosa Island will be located on Vieja anticline, situ-

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	Feb. 6		Jan. 30			
Intercoastal-Domestic—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Diesel and gas oil	.....	.....	.....	.....	.....	409,475
Gasoline	.....	.....	218,245	31,178	585,984	1,309,436
Foreign Exports—						
Crude oil	323,587	46,227	168,038	24,005	945,816	957,936
Fuel oil	203,890	29,127	137,234	19,605	949,884	1,305,354
Diesel and gas oil	4,996	714	.....	.....	133,065	383,630
Gasoline	144,347	20,621	107,295	15,328	1,024,074	1,298,179
Kerosene	57,725	8,246	5,710	816	242,402	97,837
Naphtha distillates	.....	.....	.....	.....	41,175	.....
Coastwise-Domestic—						
Crude oil	436,051	62,293	400,259	57,180	1,822,754	1,646,359
Fuel oil	299,125	42,732	321,626	45,947	1,792,507	2,079,092
Diesel and gas oil	19,375	2,768	34,831	4,976	245,849	228,379
Gasoline	144,965	20,709	221,711	31,673	1,147,495	1,184,002
Kerosene	.....	.....	10,489	1,498	16,527	52,228

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-Domestic—						
Gasoline	.....	.....	.....	.....	.....	63,975
Lubricants	.....	.....	.....	.....	.....	11,000
Foreign Exports—						
Crude oil	.....	.....	.....	.....	57,325	6,010
Fuel oil	.....	.....	.....	.....	380,408	63,610
Diesel and gas oil	.....	.....	.....	.....	110,462	113,156
Gasoline	146,365	20,909	269,521	38,503	415,886	158,075
Kerosene	78,864	11,266	.....	.....	185,350	94,961
Lubricants	8,225	1,175	.....	.....	8,225	.....
Coastwise-Domestic—						
Fuel oil	81,730	11,676	159,751	22,822	316,072	383,839
Diesel and gas oil	6,171	882	13,140	1,877	116,819	.....
Gasoline	146,799	20,971	95,246	13,607	561,210	308,416
Kerosene	10,857	1,551	.....	.....	10,857	16,877

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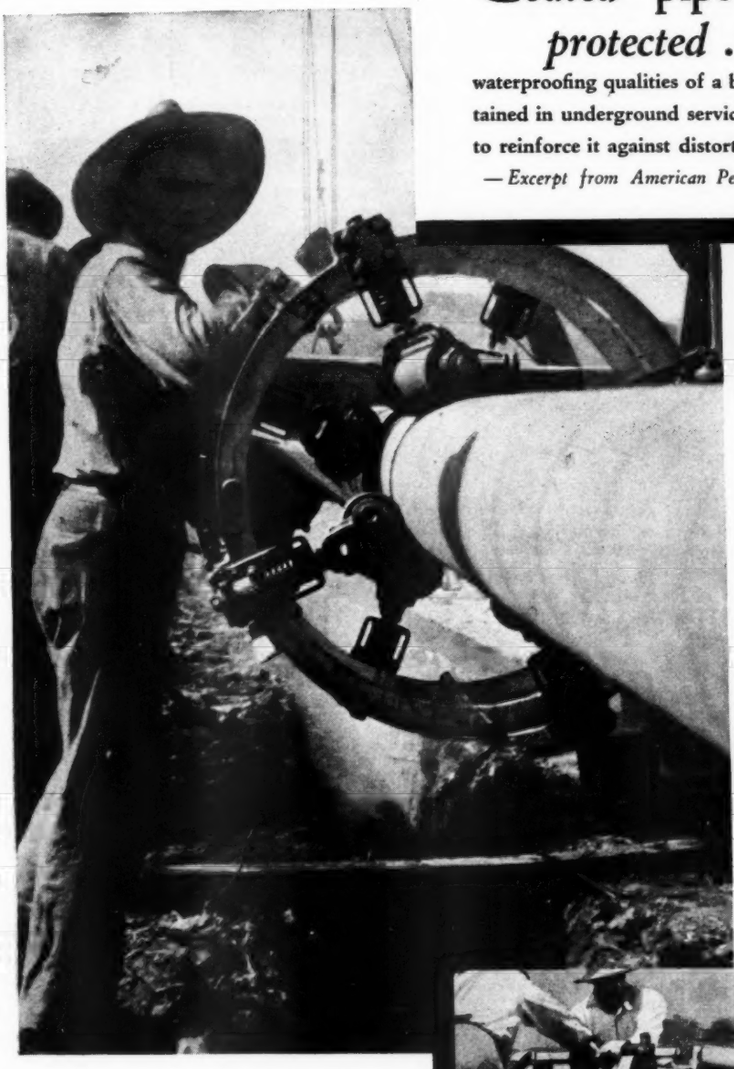

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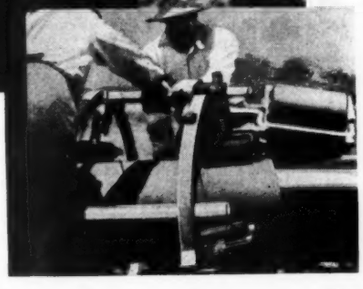

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ated approximately 5 miles north of the southern edge of Santa Barbara Island. Only a limited amount of geological work has been done on Santa Rosa Island and, while there is some question as to the exact prevailing formation, preliminary work tends to indicate it is Sespe. The Standard's exploration work will mark the first attempt of any major company to develop commercial production by actual drilling. The Marland Oil Co. and several other operators considered the advisability of drilling a test on Santa Rosa Island several years ago but declined to devote their attentions elsewhere. The Standard's test will also prove of interest because it will result in additional exploration work on Santa Rosa and Santa Cruz Island if No. 1 Vieja results in commercial production.

Ventura Avenue

The Superior Oil Co., which is drilling a deep test on the Bolsa Chica's Hartman property in the Ventura Avenue Field, ran into bottom water in No. 6 Hartman at 8,611 feet and has plugged back to 7,850 feet, from which depth an attempt will be made to complete the well. If the bottom water is excluded, No. 6 Hartman should be completed flowing approximately 500 bbls. per day as it flowed a little better than this after drilling had been resumed following the landing of a 9-inch water string at 7,445 feet. The Associated should be in a position to complete No. 83 Lloyd within a few weeks and the crew will be shifted to either No. 130 Lloyd or No. 131 Lloyd, both scheduled to be drilled in the near future. The Shell has eliminated practically all development work in the Ventura Avenue Field and is running only one string of tools.

The General Petroleum has landed a string of 3-inch tubing in No. 3 More in the Goleta Gas Field of Santa Barbara County and will attempt to complete it as a commercial gas producer. No. 3 More, the third well to be drilled in this field by the General Petroleum, was carried down to 6,912 feet in search of oil production following the completion of Nos. 1 and 2 More as substantial gas wells. No oil was found and the well has been subsequently plugged back by stages to 4,375 feet and the 6⅝-inch perforated from 4,200 to 4,350 feet. The General Petroleum was obliged to temporarily suspend drilling operations on No. 1 Hollister in this area for several days because of weather, but drilling has been resumed.

The Barnsdall and Rio Grande have secured a right of way for a pipe line out of the Gato Ridge district of Santa Barbara County and will probably begin construction of this line some time within 60 days. Preparations are being made at present to make a conclusive production test on No. 1 Tognazzini to determine whether a pipe line is justified and the diameter of pipe to be used. No. 1 Tognazzini, a joint well drilled by the Barnsdall and Rio Grande, was finished last year flowing at the rate of 1,000 bbls. per day. This well opened a new field but no subsequent work has been undertaken due to absence of pipe line facilities and also because of the fact that the Gato Ridge oil was of a heavy grade unsuitable for refining operations. Adequate tankage has been erected on the Tognazzini property and a conclusive test will be made.

Two new locations were staked in the Fruitvale Field of Kern County, but no definite date has been set for this new drilling. Operators have not experienced any great difficulty in disposing of current production but the production now exceeds the demand. Fruitvale crude has a gasoline content of approximately only 3 per cent and is unsatisfactory for fuel oil purposes because of its low B.t.u. value. Its chief use has been to reduce the viscosity of heavy Kern River crude which is being shipped for use in Arizona smelters.

OUSTER SUIT RULING AWAITING ARGUMENTS

AUSTIN, Tex., Feb. 22.—Arguments were concluded Thursday before District Judge J. D. Moore on a plea of Attorney General James V. Allred for judgment by default against the Standard Oil companies of California and New Jersey, the Socony-Vacuum Corp. and the Shell Union for alleged violation of Texas anti-trust laws.

When court resumes Tuesday arguments will be started on the pleas in abatement based on the alleged misjoinder of concerns and in the direct cause of action. The various defendants object to being tried on the demurrers.

The court said R. C. Holmes, president of The Texas Company, and nine vice presidents of that concern would not be summoned to Austin to testify until the law points are cleared away and the trial is ready to start on its merits.

J. E. STOCK, INDEPENDENT OIL OPERATOR, IS DEAD

SHREVEPORT, La., Feb. 20.—Joseph Earl Stock, 49, prominent independent oil operator, died Tuesday, February 16, following an operation for appendicitis. The body was sent to Denver, Colo., for interment in the family mausoleum.

Mr. Stock was born in Franklin, Pa. He took an active part in the development of the Casper and Salt Creek Fields of Wyoming. Several years ago, Mr. Stock moved from El Dorado, Ark., to Shreveport, after being active in oil fields of North Louisiana and Arkansas. He leaves his wife, his father, H. G. Stock, Long Beach, Calif.; a stepson, Cliff Stovall; a sister, Miss Prairie Stock, Hollywood, Calif.; and five brothers, Otto Stock, who operates a refinery in Florence, Colo.; C. D. Stock, Denver; Paul Stock, who operates a refinery in Billings, Mont.; Lee Stock, El Paso, Tex.; and Jay Stock, Los Allos, Calif.

SEVERAL MT. PLEASANT WELLS GETTING CLOSE TO DUNDEE SAND

By George A. Whitney

MOUNT PLEASANT, Mich., Feb. 22. No completions were reported from the Michigan fields, but several are getting close to the depth where the Dundee formation is found. The test being drilled by Mildred D. Wells of Saginaw and George Miller of Lansing, on the Thom farm, 8 half SE Section 9, Lee Township, Midland County, does not look very good at this time. It is about 3 miles east of production in the East Field, where the top of the Dundee was found at 3,549 feet and at 85 feet in the Dundee formation at a total depth of 3,679 feet failed to make a showing of either oil or gas. It also failed to show any water, something out of the ordinary for the field. A stray sand is said to have been passed through at 3,503 feet, which was first thought to be the Dundee.

No. 1 Hewitt test, drilled by L. G. Thompson in Section 18, Lee Township, Midland County, last November is close to 3 miles west of the Thom test in Section 18, same township, and between the Thom test and the East Pool, and was reported good for an initial of 50 bbls. Another test drilled by the Theodore Oil Co., on the S. N. Robinson farm, SW SW NW Section 26, same township, struck water from 3,568 to 3,668 feet, and abandoned as a dry hole.

Pure Oil Co. is about due to complete No. 1 Mason-Kidder farm, NE NE NE Section 17, Greendale Township, Midland County, between the East Pool and the old Chippewa Pool. Same company's No. 1 on the Joe Novak and others' farm, SE NW NE Section 18, Greendale Township, was a 20-bbl. producer in the Dundee from 3,501-51 feet and will be given a shot.

The Pure Oil Co. has started drilling No. 6 on the Sias farm in Section 8, Greendale Township, Midland County. Same company secured a permit to drill No. 1 on the Pringle heirs farm, SW NW Section 14, 727 feet from the south line and 1,152 feet from the west line of the lease. Same company has abandoned its location for No. 1 on the Bond-Tinney farm, NE NE NW Section 14. Same company has a location for No. 1 well, 990 feet from the north line and 330 feet from the west line of the Emma O. Reed farm, N half SE Section 10, same township. Same company is drilling No. B-2 Edward Barnard farm, NW SW Section 10, same township, upon

(Continued on Page 74)

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S.	T.	R.	Depth	Status—
Hines Pet., No. 1 Ocean Park, Los Angeles Co.	9-	2-	15	7,414	suspended
Taylor Oil Co., No. 1 Culver, Los Angeles Co.	12-	2-	15	6,238	suspended
Westwood Oil Co., No. 2 Hermosa, Los Angeles Co.	6-	4-	14	2,151	suspended
Staple Oil Co., No. 1 Manhattan, Los Angeles Co.	24-	2-	15	2,700	suspended
Lawndale Pioneers, Inc., No. 1 Peck, Los Angeles Co.	20-	3-	14	6,175	gr. sd. drilling
Mohawk Pet., No. 1 El Nido, Los Angeles Co.	29-	3-	14	6,000	sd. sh. drilling
Ranger Pet. Co., No. 1 Watson, Los Angeles Co.	28-	4-	13	3,785	pump 25 B/D
Brubaker, W. O., No. 1 Van Nuys, Los Angeles Co.	11-	2-	15	2,700	suspended
Rucker & Croul, No. 2 Puente, Los Angeles Co.	27-	2-	10	2,200	suspended
El Dorado Oil Co., No. 1 Puente, Los Angeles Co.	30-	2-	9	2,250	suspended
Cudahy Oil Co., No. 1 Bell, Los Angeles Co.	30-	2-	12	1,370	suspended
Jones, W. L., No. 1 Bell, Los Angeles Co.	31-	2-	13	1,202	sd. sh. drilling
Weist Oil Co., No. 1 Montebello, Los Angeles Co.	34-	1-	11	4,902	suspended
Blinn & Gray, No. 1 Montebello, Los Angeles Co.	6-	2-	11	6,060	test W.S.O.
Wardell & Menichini, No. 1 Montebello, Los Angeles Co.	7-	2-	11	rig	rigging up
Yellowstone Oil Co., No. 1 Alhambra, Los Angeles Co.	34-	1-	13	2,919	suspended
Yellowstone Oil Co., No. 2 Alhambra, Los Angeles Co.	19-	1-	12	2,015	suspended
Davidson Oil Co., No. 1 Monterey Park, Los Angeles Co.	32-	1-	12	....	location
Rucker, L. W., No. 1 Calabasas, Los Angeles Co.	26-	1-	17	1,004	suspended
Caballero Estates, No. 1 Calabasas, Los Angeles Co.	23-	1-	16	1,460	suspended
Marble, Willard, No. 1 Chatsworth, Los Angeles Co.	6-	2-	16	1,395	suspended
Ajax Pet., No. 1 Newport, Orange Co.	21-	6-	10	7,030	gr. sd. drilling
Beck, Alfred, No. 1 Corona, Riverside Co.	8-	4-	6	1,110	suspended
Spindletop Oil Co., No. 1 Salton Sea, Riverside Co.	25-	7-	10	3,533	sd. sh. drilling
Duncan, N. L., No. 1 Sagebrush, Riverside Co.	8-	4-	6	1,157	suspended
Colan Dev. Co., No. 1 Redlands, San Bernardino Co.	25-	1-	2	2,392	suspended
Mason Oil Co., No. 1 Salton Sea, Imperial Co.	1-	17-	15	635	sd. sh. drilling
Woods, D. H., No. 1 Salton Sea, Imperial Co.	7-	11-	16	670	sd. sh. drilling
Borderland Oil Co., No. 1 Encinitas, San Diego Co.	13-	13-	4	2,519	suspended
Borderland Oil Co., No. 2 Encinitas, San Diego Co.	13-	13-	4	1,899	sd. sh. drilling
South Bay Oil Co., No. 1 Border, San Diego Co.	31-	18-	2	1,242	suspended
Itasca Pet. Co., No. 1 Mesa, San Diego Co.	33-	18-	1	1,700	cemented
Carr, O. K., No. 1 Capistrano, San Diego Co.	13-	6-	8	5,250	suspended
Oklahoma Oil Corp., No. 1 Palms, San Diego Co.	26-	11-	8	1,128	sd. sh. drilling

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S.	T.	R.	Depth	Status—
Standard, No. 1 Santa Rosa Island, Santa Barbara Co.	.....			....	location
Barnsdall, No. 1 Los Alamos, Santa Barbara Co.	31-	8-	33	2,030	sd. sh. drilling
Western Gulf, No. 1 Santa Maria, Santa Barbara Co.	5-	9-	33	8,566	sidetracking
Midwest Oil Co., No. 1 Los Alamos, Santa Barbara Co.	2-	7-	35	3,450	suspended
General Pet., No. 3 Goleta, Santa Barbara Co.	21-	4-	28	6,912	plug 4,375 feet
General Pet., No. 4 Goleta, Santa Barbara Co.	3-	4-	29	1,146	sd. sh. drilling
General Pet., No. 133 Goleta, Santa Barbara Co.	21-	4-	28	2,030	suspended
General Pet., No. 134 Goleta, Santa Barbara Co.	21-	4-	28	2,053	suspended
General Pet., No. 136 Goleta, Santa Barbara Co.	21-	4-	28	2,047	suspended
General Pet., No. 137 Goleta, Santa Barbara Co.	21-	4-	28	2,050	suspended
Bowles Oil Co., No. 140 Goleta, Santa Barbara Co.	21-	4-	28	2,065	suspended
U. S. Pet., No. 141 Goleta, Santa Barbara Co.	20-	4-	28	2,004	suspended
U. S. Pet., No. 142 Goleta, Santa Barbara Co.	20-	4-	28	2,012	suspended
U. S. Pet., No. 143 Goleta, Santa Barbara Co.	20-	4-	28	2,010	suspended
El Camino, No. 149 Goleta Tideland, Santa Barbara Co.	22-	4-	28	2,010	suspended
Bellview Oil Co., No. 159 Goleta, Santa Barbara Co.	24-	4-	29	2,099	suspended
Johnson & Strickland, No. 1-A Goleta, Santa Barbara Co.	19-	4-	27	4,886	suspended
The Texas Co., No. 2 Carpinteria, Santa Barbara Co.	34-	4-	24	718	suspended
Sovereign Oil Co., No. 1 Guadalupe, Santa Barbara Co.	20-	10-	35	5,500	suspended
Pacific Western, No. 1 Gibraltar, Santa Barbara Co.	14-	5-	27	2,345	suspended
Pacific Finance Co., No. 1 Carpinteria, Santa Barbara Co.	tideland			3,011	suspended
Associated, No. 1 Rincon Creek, Ventura Co.	19-	4-	24	2,080	suspended
Bell, H. H., No. 1 South Mountain, Ventura Co.	22-	3-	21	2,270	cemented
Pure Oil Co., No. 1 S. F. Canyon, Ventura Co.	15-	4-	21	2,591	suspended
Union, No. 1 Calumet, Ventura Co.	3-	3-	19	....	location
Woodruff Oil Co., No. 1 Miguelito, Ventura Co.	4-	3-	24	....	location
American Oil Co., No. 1 Conejo, Ventura Co.	33-	2-	20	1,560	resume work
Graham & Loftus, No. 1 Goose Lake, Kern Co.	20-	27-	22	6,100	sd. sh. drilling
General Pet., No. 1 Buttonwillow, Kern Co.	6-	28-	23	2,615	cleaning out
Wilshire Oil Co., No. 1-A Buttonwillow, Kern Co.	7-	29-	24	7,000	suspended
Milham Expl. Co., No. 10 Buttonwillow, Kern Co.	5-	28-	23	2,570	sd. sh. drilling
Purman, T. H., No. 1 McKittrick, Kern Co.	32-	29-	21	3,100	sd. sh. drilling
Welport Oil Co., No. 8 McKittrick, Kern Co.	26-	29-	21	1,114	sd. sh. drilling
Federal Drlg. Co., No. 1 Buena Vista, Kern Co.	20-	31-	24	5,380	suspended
General Pet., No. 1 Beiridge, Kern Co.	30-	28-	21	8,125	br. sh. drilling
Wallace, K. C., No. 1 Beiridge, Kern Co.	32-	29-	21	4,223	suspended
Rio Cal Pet., No. 1 Shale, Kern Co.	2-	27-	18	2,355	suspended
Wicker, Sy., No. 1 Arvin, Kern Co.	12-	30-	28	3,860	suspended
Shell, No. 1 Weed Patch, Kern Co.	29-	30-	29	5,910	suspended
Osborn, Colter, No. 1 Weed Patch, Kern Co.	15-	30-	29	3,465	suspended
Fullerton Oil Co., No. 3 Semitropic, Kern Co.	25-	27-	23	940	core hole
Standard, No. 1 Devil's Den, Kern Co.	14-	25-	16	1,800	suspended
Cumberland Oil Co., No. 2 Devil's Den, Kern Co.	17-	26-	18	3,225	fishing
Signal Oil Co., No. 1 Blackwell Corner, Kern Co.	15-	26-	19	106	suspended
United Kern Pet., No. 1 Mojave, Kern Co.	26-	10-	14	1,065	suspended
Meridian Oil Co., No. 1 Mojave, Kern Co.	11-	9-	15	4,000	suspended
Kendall Dev. Co., No. 1 Mojave, Kern Co.	27-	11-	9	1,681	hd. sd. drilling
Harding, J. B., No. 1 Mojave, Kern Co.	5-	10-	10	1,030	redrilling
Barnsdall Oil Co., No. 1 Tejon, Kern Co.	15-	11-	30	3,580	sd. sh. drilling
Ritchie, J. J., No. 1 Tejon, Kern Co.	33-	11-	9	3,025	suspended
Descanso Oil Co., No. 1 Tejon, Kern Co.	31-	11-	19	1,116	sd. sh. drilling
Associated, No. 1 Jacalitos, Fresno Co.	22-	21-	15	6,197	suspended
Kingsburg Expl. Co., No. 1 Kingsburg, Fresno Co.	30-	16-	23	2,390	suspended
Kent & McDonald, No. 1 Carrizo, San Luis Obispo Co.	3-	32-	22	2,630	suspended
Trav-El Oil Co., No. 1 Carrizo, San Luis Obispo Co.	7-	32-	22	2,450	suspended
Indian Dome Oil Co., No. 1 Edna, San Luis Obispo Co.	26-	31-	12	3,380	cleaning out
Martin, J. D., No. 1 Edna, San Luis Obispo Co.	5-	31-	13	3,070	suspended
Paso Robles Oil Co., No. 1 Edna, San Luis Obispo Co.	27-	27-	11	4,160	redrilling
Emerick Oil Co., No. 1 Atascadero, San Luis Obispo Co.	13-	28-	12	1,785	sd. sh. drilling
Schilling, C., No. 1 Atascadero, San Luis Obispo Co.	1-	29-	12	1,650	suspended
Pacific Inland, well No. 1, Monterey Co.	19-	23-	15	3,280	suspended
Brown, W. F., No. 1 Parkfield, Monterey Co.	15-	23-	14	1,051	cleaning out
Guess, E. B., No. 1 Corcoran, Kings Co.	7-	21-	21	6,197	suspended
Niel, W. B., No. 1 Dudley Ridge, Kings Co.	32-	22-	20	rig	rigged up
Guess, E. B., No. 1 Dudley Ridge, Kings Co.	12-	22-	22	1,996	suspended
Irma Investment Co., No. 2 Dudley Ridge, Kings Co.	7-	22-	20	1,224	testing
Eagle Oil Co., No. 1 Dudley Ridge, Kings Co.	15-	22-	10	1,135	cleaning out
Valley Expl. Co., No. 1 Dudley Ridge, Kings Co.	12-	23-	19	1,302	cemented
Knudsen & Schmidt, No. 1 Reef Ridge, Kings Co.	36-	23-	17	5,894	redrilling
Seymour, L. W., No. 1 Avenal, Kings Co.	10-	23-	16	1,148	suspended
Tulare Basin Gas Co., well No. 1, Kings Co.	2-	23-	19	1,106	bl. sh. drilling
Tulare Oil Co., No. 1 Corcoran, Tulare Co.	20-	22-	22	rig	suspended
Ducor Pet. Co., No. 1 Ducor, Tulare Co.	14-	24-	27	2,200	suspended
Inland Valley Oil Co., No. 1 Visalia, Tulare Co.	24-	17-	24	2,092	suspended
Gravity Expl. Co., No. 1 Alpaugh, Tulare Co.	11-	24-	23	rig	suspended
Ellis & Sanford, No. 1 Tulare Lake, Tulare Co.	20-	24-	23	1,920	plug 1,487 ft.
Twin State Oil Co., No. 1 Point Arena, Mendocino Co.	14-	12-	17	7,694	suspended
Napa Oil Co., No. 1 Griffith, Napa Co.	7-	8-	3	2,848	cemented
Orinda Pet., well No. 1, Contra Costa Co.	32-	1-	3	2,120	suspended
Colusa Oil Co., No. 1 Bush, Colusa Co.	31-	15-	4	1,040	suspended
Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co.	3-	2-	10	4,750	cleaning out
Hilderbrandt, R., No. 1 Crows Landing, Stanislaus Co.	36-	6-	7	1,130	suspended
Orland Oil Synd., No. 1 Orland, Tehama Co.	31-	23-	3	3,040	suspended
Union Oil Co., No. 1 Tracy, San Joaquin Co.	14-	3-	6	4,900	bl. sh. drilling

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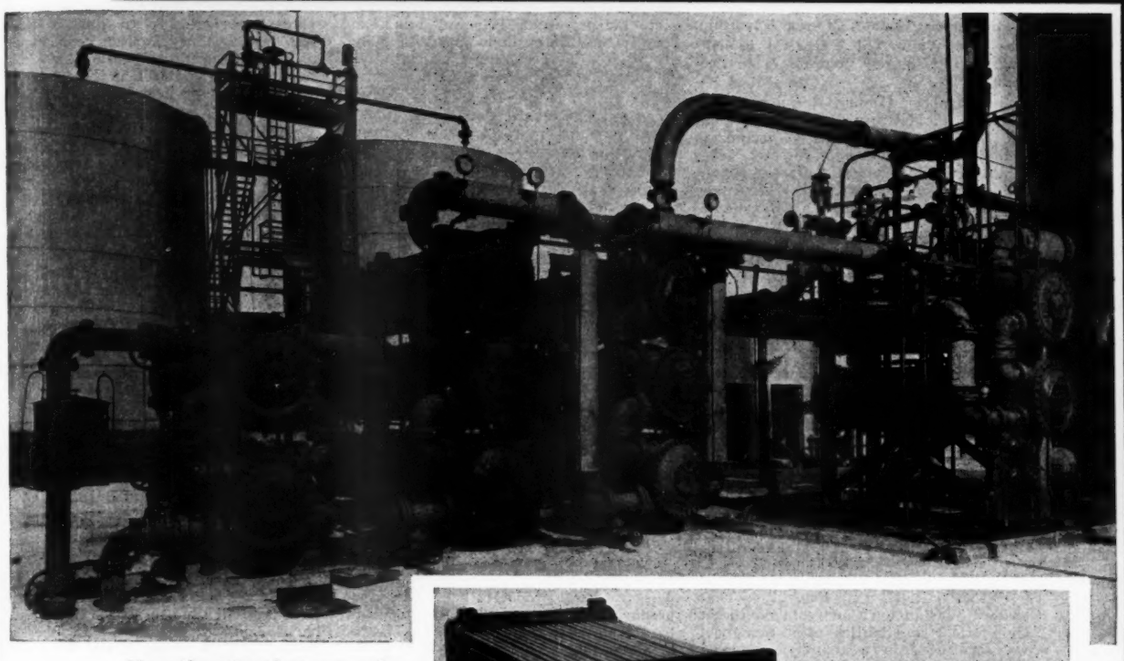

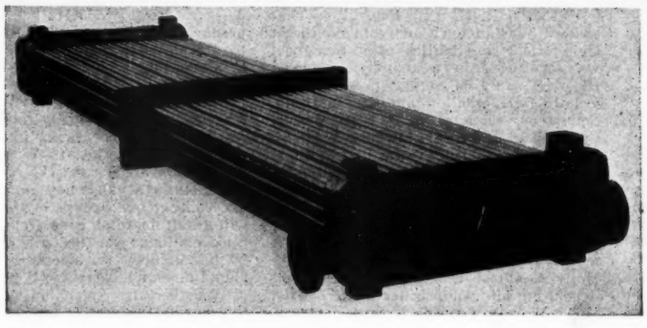

Top—Absorption plant as manufactured by the C. F. Braun Corporation, Alhambra, Calif. All units in this photo use standard Toncan Iron Pipe for tubes.

Right—Expansive type cooling sections as used in gasoline absorption plants. All tubes are of standard Toncan Iron Pipe.

Pipe corrosion and costly plant "shutdowns" go hand in hand. Yet these expensive non-productive periods are largely unnecessary since the introduction of Toncan Iron Pipe.

This statement is borne out by the experience of plant operators and is further attested by the results obtained in service from the equipment of many manufacturers of refinery units. Test after test has demonstrated that in lines and equipment where the life of non-alloy ferrous pipe is sometimes measurable in days, Toncan Iron Pipe, after months of service, shows no corrosion, no pitting, no appreciable loss in weight.

Toncan Iron is an alloy of refined iron, copper and molybdenum. Its resistance to corrosion is an acknowledged fact. In still lines, condensers, acid sludge lines, absorption units—underground or exposed to the elements—Toncan Iron Pipe may be the answer to the ever present problem "How can we minimize 'shutdown' losses?"

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Increased Completions in Central Ohio

Stark County Maintains Lead in Gas Activity. Wyandot County Busiest in Lima Field. Indiana Operations Detailed

By George A. Whitney
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Feb. 22.—The Central West Field, comprising the Lima Field, Central Ohio, Indiana and Illinois Fields, shows very little completed work outside of the Central Ohio division, where more wells were brought in than in the other three areas combined. Michigan and Kentucky failed to show any completions of any great value. Reports are that the Gulf Pipe Line Co. is expecting to enlarge its line from Jenks to Cincinnati, Toledo and Pittsburgh.

The bulk of drilling in the Lima Field is centered in Wyandot County. In Tymochtee Township, of this county, McPheron, Miller and Cook's No. 4 Bowman-Brillhart farm, Section 21, does not look very encouraging as there was only a slight showing at 1,373-83 feet. The same condition prevails at Murphy and others' test on the C. S. Grubel farm, Section 7, Crawford Township, as the showing was light from 1,466-68 feet, which is the Trenton lime. O'Neal and others' No. 1 Homer Wonder farm, Section 1, same township, does not look very good at a depth of 1,347 feet. Upper Sandusky Gas Co. is drilling on the Saltzman farm, in Crane Township, same county, while R. W. Kurtz and others are drilling No. 2 Elmer E. Moser, Section 12, Ridge Township, same county.

CENTRAL OHIO

Fourteen completions were reported from the Central Ohio Field (including two in Meigs County, on the outer edge of the field), of which two were producers with an initial of 85 bbls.; six dry holes and six gas wells, quite an increase over the previous week. Stark County maintains the lead of all counties, as the drilling there is more for gas than oil. Stark County gas is found below 4,000 feet and it requires a long time to bring in wells.

In Ashland County no new wells were reported. The only change from the previous week is a drilling well by Harmon & George, No. 6 on the David Horn, Section 4, Lake Township. Hulse & Kundtz have a rig on the Clare Fraunfelder, Section 10, Montgomery Township. Commonwealth Gas Corp. is reported down close to 2,000 feet with No. 1 Oratta Bennett farm, Section 31, Jackson Township. Eddy and others are shut down at No. 4 on the Edward Gardner, Section 17, Perry Township.

In Lorain County, McMillan and others' test on the H. and C. Norton, Section 15, Avon Township, is dry in the Clinton from 2,375-77 feet. Ohio Fuel Gas Co. is drilling No. 2-5,633 Frank Stepka, Lot 72, Grafton Township. Ramage and Willis' No. 2 Fred Armbruster, also in Lot 72, is down to 2,250 feet.

In Medina County, Chatham Township, Edson Sons Co.'s No. 36 Marcus A. Frank, Lot 20, is reported with an initial of 60 bbls. from the shallow pay sand from 412 to 500 feet, and is one of the good wells; in fact any well in that field that will make a 24-hour gauge of that much crude, which is a natural lubricant, is far above the average. Same company found a dry hole in No. 32 on the George W. Packard farm, Section 4, same township, from 353 to 366 feet. Oko Oil & Gas Co.'s No. 36, Jess McVickers, same field, is reported dry at 435 feet. In Harrisville Township, same county, Barnhart and others No. 7 Joseph Funk, Section 6, is reported with an initial of 25 bbls. from 320 to 377 feet.

In Holmes County, Monroe Township, the Paint Valley Oil & Gas Co. is drilling on the Andrew Johnson farm, Section 20.

In Cuyahoga County, Rockport Township, L. T. McGrath's test on the John E. Raible, not far from Cleveland, is reported dry from 2,455-57 feet.

In Richland County, Jefferson Township, the Commonwealth Gas Corp. has started a test on the Angeline Cates, Section 11. Chesrown and others' No. 1 Samuel Simpson farm, Section 9, Franklin Township, which was reported a dry hole in the Berea sand from 297 to 305 feet, may be drilled deeper in the near future, at least to the lime formation. Daly and others, according to advices, are going to drill deeper on the A. J. Petit farm, Section 7, Plymouth Township, same county, in hope of breaking into the pay sand. This well was found dry in the Clinton lime, and drilling continued to the Trenton, at a total depth of 3,192 feet, or 60 feet in the Trenton lime.

Summitt County

In Summitt County, Bath Township, the Wiser Oil Co. has a rig on the O. C. Conlan, Lot 84. Arthur & Reeves are reported at 3,300 feet on the N. Kandle, Section 36, Green Township, while Smith and others' test on the Charles A. Smith, Section 36, same township, is reported at 3,725 feet. Barnhart and others are reported shut down at 600 feet on the M. G. and C. O. Osborn, Section 2, Richfield Township, same county.

In Licking County, Fallsburg Township, the Emerald Petroleum Co. drilled a dry hole on the Thomas Moren, Section 13, from 866 to 873 feet. Same company has rigged up to start a second test on the Sidney Tarlton farm, Section 9, same township. Wehrle Gas Co. is reported at 1,850 feet in No. 4 on the Fred W. Hobart heirs farm, Lots 5 and 6, Granville Township. Fred Eshelman's test on the Stanton Wilson, Section 12, Mary Ann Township, is a light gas well at from 630 to 639 feet. Armstrong & Lytle are going to drill deeper their No. 5 on the J. W. L. Motherspaw, Lot 12, Franklin Township, same county.

In Muskingum County, the Atha Co. has a rig on the Jacob S. Morrison, Section 5, Union Township. Palmer and Geisinger are testing casing at 3,900 feet on the Bertha E. Drake, Section 3, Brush Creek Township. Fritz Oil & Gas Co.

(Continued on Page 72)

May Have New Pool in Southeast Ohio

Well in Eastern Washington County Flows 100 Bbls. 50.5 Gravity Oil With Heavy Head. Additional Tests to Be Started

By Staff Correspondent

PITTSBURGH, Pa., Feb. 22.—That eastern Washington County in Southeast Ohio offers possibilities of a new pool was evidenced in a completion during the week. In this county, producers are usually fairly shallow and in the Injun, Squaw or Berea sands. On the Joseph Crago farm, at the headwaters of Cady Run in Grandview Township, William Harris and others, about a year ago, completed a test in the Injun sand which had a light showing of oil but not sufficient to warrant completing in that formation. Later the hole was drilled deeper in the squaw sand with a similar result. Recently this test was drilled deeper and struck an oil sand, believed to be the Third Warren formation, at a depth of 2,916 feet. The well was shut in until storage and pipe line facilities could be arranged as it gave evidence of being a producer of some size.

At the first test the well flowed about 100 bbls. with a heavy head. The pressure broke the lines and before being shut in sprayed the countryside. The head may be due to a showing of gas with the oil, the gas being estimated at about 85,000 feet a day. The oil is unlike that of the shallower sands, being high in gravity, 51.5 degrees, contrasted with about 40 degrees for the Injun and Berea, and lighter in color.

In all probabilities, there will be additional tests started in this vicinity as the ground has already been covered and leased. Close by, James Campbell of Marietta, and Junius Greenwood of Newport, have leased the E. E. Knowlton tract of 80 acres, and have leased all told about 400 acres. E. J. Mildren, an operator in this section, holds leases on about 300 acres. The owners of the present test include, besides William Harris, Lucille Harris, John B. Joy of Wade, and the Griffiths Motor Co. of Marietta.

There was a further decrease in the number of wells completed during the past week in the three divisions of the Eastern fields. The totals are three oil producers, with an initial production of 122 bbls., two gas wells and one dry hole.

Tide Water Curtails Runs

The Tide Water Pipe Co. has cut its runs in the Allegany Field in New York State, the reason given being that Allegany Field producers have been overproducing. In a notice sent to producers the Tide Water company says:

"Commencing February 16, and for the remainder of the month of February, Bradford Transit gaugers will be instructed by this company to restrict the runs from tank or tanks in which you own an interest, i.e., to 75 per cent of the daily average runs therefrom during the months of December and January. According to our figures, in your case this will result in total runs from the above tank or tanks for the period February 16 to 29 inclusive, amounting to (individual amount) barrels.

"Whether any restriction will be effective during the month of March will depend entirely upon the marketing situation, and you may expect further advice from this office with respect to our purchases prior to the first of the month."

SOUTHEAST OHIO

Additional completions in Southeast Ohio were few. The productive sands of Medina County gave E. R. Edson & Son Co. a 20-bbl. producer on the M. A. and Eva Franks farm on Lot 20, Section 16, Chatham Township. This well, No. 34, is a shallow sand producer from a depth of 500 feet.

In Muskingum County, the Wittmer Co. completed its test on the Frank Drake farm in the SW, Section 3, Brush Creek Township. It is a gas well in the Clinton sand at a depth of 4,065 feet and has a showing of about 350,000 feet a day.

The Ohio Fuel Gas Co. found the Clinton sand dry on the Gibson heirs' farm in the NW, Section 23, Brush Creek Township, Muskingum County. It was a test on that farm and was abandoned after drilling to a depth of 4,055 feet.

WEST VIRGINIA

The West Virginia division reported one oil well, with a 2-bbl. initial production, and one gas well. These figures put the West Virginia Field at a new low record and with the present price structure and the impossible condition of the roads in outlying districts it is not likely that completion figures will return to their old levels for some time.

In the Court House district, Lewis County, the Southern Oil Co. completed No. 5 on the Cordelia and M. L. Butcher farm as a 2-bbl. a day producer naturally from the Salt sand formation after reaching a depth of 1,320 feet. In Sheridan district, Lincoln County, the test operation of the Kanawha Gas & Utilities Co. on the Nona Johnson farm was completed at a depth of 2,045 feet and is showing for a light gas well.

C. B. Lewis and others have their test on the Delia Lyons farm in Murphy district, Ritchie County, completed at 1,742 feet and ready for a test as has the Robert Wilson Oil Co. in its No. 23 on the Ritchie Mines tract in the same district and county. This well, an old one drilled deeper, now stands at 1,891 feet.

Drilling in West Virginia

Wilson and Mowery have a rig standing for a second test on the Hans Watts Realty Co. lease in Guyandotte district, Cabell County. The test of C. C. Wolfe and others on the J. S. Stanley farm in the same district and county is drilling at 1,840 feet. A. F. Black, trustee, is drilling at 1,950 feet on the Guyan Valley Bank lease in Union district, Wayne County. In Stonewall district, Wayne County, the Wayne United Gas Co. is drilling No. 51 on the Newcomb tract, which has reached 1,900 feet. The same company is shut down in No. 40 on the A. W. Wilson heirs' farm in Lincoln district, after reaching 1,720 feet. Locations have been made by this company for Nos. 52 and 53 on the Hoard Baldwin farm in Stonewall district. The Owens Illinois Glass Co. has made a location on the T. A. Copley farm in Lincoln district, Wayne County.

The Heck Oil Co.'s No. 3 on the J. E. and J. G. Watkins farm in Reedy district, Wirt County, still stands shut down after having reached 400 feet. In Ravenswood district, Jackson County, the test of G. G. Griffin and others on the D. E. Cole farm is drilling at 800 feet.

In Logan County, West Virginia Gas Co. is shut down with a fishing job on hand in its No. 36 on the Dingess Run Coal Co. tract in Logan district, and in the same district, the same operator has cleared a location for No. 27 on the same tract. No. 36 reached a depth of 2,370 feet before losing the tools.

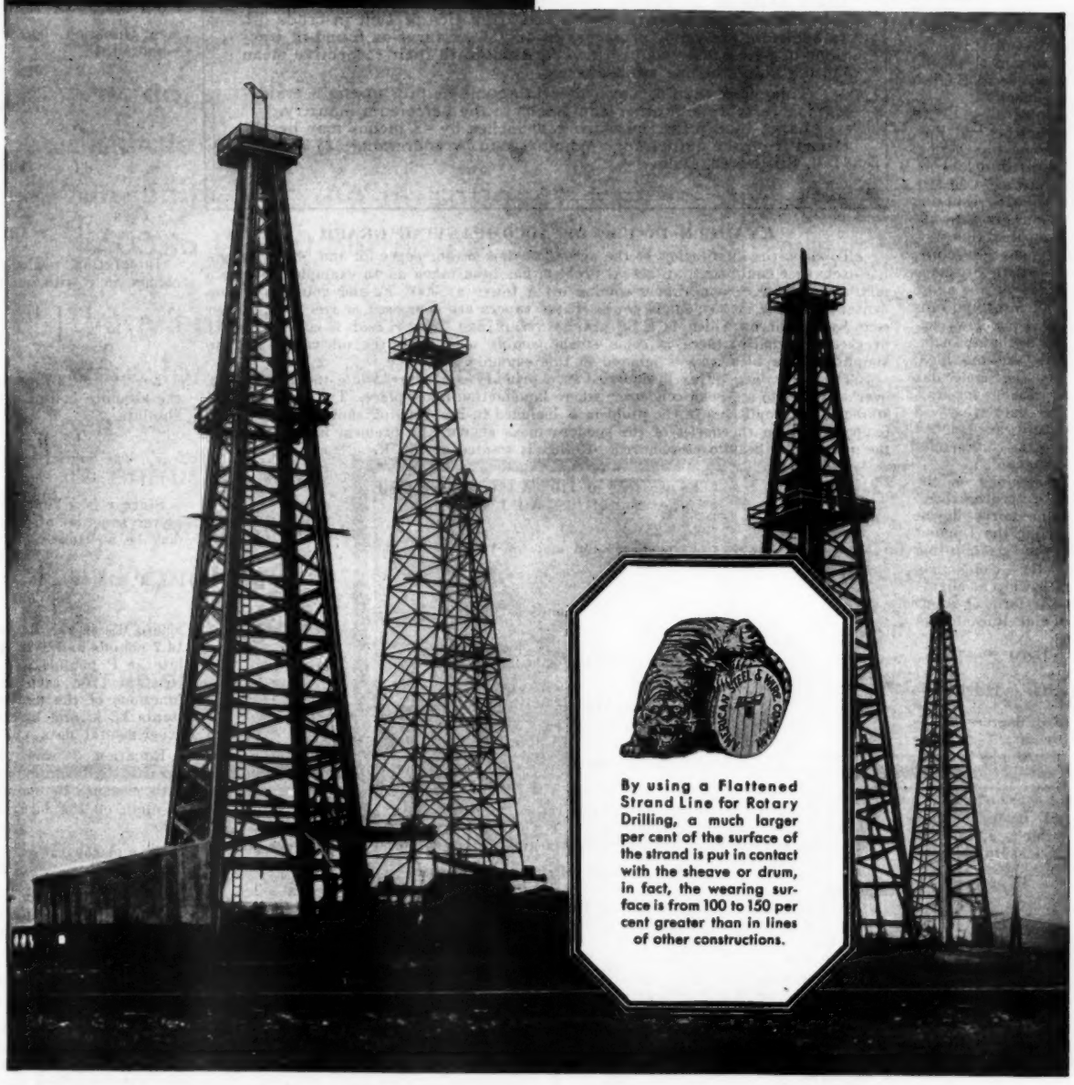
The Owens Illinois Glass Co. has a rig standing on the Joseph Orth farm

(Continued on Page 72)

AMERICAN STEEL & WIRE COMPANY WIRE LINES

Where Dependability is Vital

In the oil fields—where uninterrupted service is vital—the selection of wire lines deserves more than ordinary care. Because of their proved dependability and greater economy, most operators specify American Steel & Wire Company Wire Lines. It will pay you to know why in detail. Our engineers, in the oil country, will gladly assist you in solving your wire line problems.


By using a Flattened Strand Line for Rotary Drilling, a much larger per cent of the surface of the strand is put in contact with the sheave or drum, in fact, the wearing surface is from 100 to 150 per cent greater than in lines of other constructions.

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Thermal Properties of Oil Fractions

Experimental and Theoretical Data Used to Prepare Graph Useful in Designing Refining Equipment

By Wayne C. Edmister
Oklahoma A. and M. College

A chart giving thermal properties of petroleum hydrocarbon vapors should possess two characteristics, accuracy and consistency. It may be considered accurate when it shows satisfactory agreement with the most trustworthy experimental data, which we find by a careful survey of the literature. The chart is thermodynamically consistent when values from it may be represented by thermodynamical relations; it is considered graphically consistent when a smooth, regular family of curves result.

To be of most value to American and English engineers data will be in English units and correlated graphically.

Vapor Pressure

In a recent article[1] Edmister and Buskel presented a chart showing thermal properties of normal paraffin hydrocarbons correlated by Cox's method[2] and Hildebrand's function. In deriving equation for vapor pressures the authors used the intercept form of straight-line equation, using the intercept at 1 pound absolute. The equation derived satisfies experimental data above pentane or for those compounds whose 1-pound intercept falls on the chart or above 0° F. Below pentane or from pentane to methane, inclusive, the vapor pressures are too high, the error increasing as the molecular weight decreases. The reason for this discrepancy lies in the fact that as lower and lower temperatures are reached approaching absolute zero the corresponding vapor pressure is increased.

Lines representing compounds on the chart "Thermodynamics of Hydrocarbon" from pentane to methane curve downward, below 0° F. So using the 1-pound absolute intercept in the straight-line equation gives lines for compounds methane to pentane which were at slightly too high pressures. The form of equation used by Edmister and Buskel was empirical:

$$\log_{10} P = \frac{12{,}240\,[t - 150M^{-.397} + 730]}{[t+382]\,[3{,}100 - 150M^{-.397}]}$$

where t = temperature in degrees F.
M = molecular weight.
P = pressure in pounds per sq. in. abs.

In order to construct a consistent chart a formula is developed from thermodynamical principles which gives the pressure-temperature relationship for normal paraffin hydrocarbons.

The Claperon equation:

$$r = AT\frac{dp}{dT}(v'' - v') \qquad (1)$$

may be used in finding an equation which will be thermodynamically consistent.

The pressure-volume temperature relation for any hydrocarbon may be represented by modifying the perfect gas equation:

$$V = \frac{BT}{p}; \quad B = \text{gas constant.}$$

In the first place there must be a correction for the volume of the liquid on the left side. Replacing V by $(v'' - v')$, where v'' is specific volume of the vapor and v' is the specific volume of the liquid, it is now necessary to correct the right side of the equation by some function of p and T in order to make equation valid. We then obtain:

$$(v'' - v') = \frac{BT}{p} - f(P, T) \qquad (2)$$

[1]The Oil and Gas Journal, July 2, 1931.
[2]Journal of Industrial and Engineering Chemistry, Vol. 15, p. 593.

GRAPH SHOWING THERMAL PROPERTIES OF OIL

This article and the graph on pages 52 and 53 were prepared from actual experimental data and thermodynamical relations by Wayne C. Edmister as a special problem at Oklahoma A & M College, School of Engineering. These data include vapor pressures and latent heats of all normal paraffin hydrocarbons and most of the isomers, unsaturates, naphthenes and aromatics present in crude oil. In addition, the vapor pressures of actual mixtures as found in fractions of petroleum grouped in accordance with their respective mean boiling points at one atmosphere.

This chart should prove interesting and helpful to engineers designing refinery and other equipment in the petroleum industry.

Large blue prints measuring 30 inches by 42 inches may be obtained from the author for a nominal sum by addressing 328 Hanner Hall, Stillwater, Okla.

EXAMPLE IN USE OF ACCOMPANYING GRAPH

To show the application of the accompanying graph, pages 52 and 53, in designing exchanger equipment, an actual problem has been taken as an example. Assume a mixture of hydrocarbon vapors coming off a tower at 300° F. and going to a condenser operating at 25 pounds gauge. These vapors are composed of fractions, 75 per cent by weight of which is a 68 gravity reflux and 25 per cent is a 110 gravity overhead. Actually, there is some steam coming over with the oil vapors but to simplify the problem this is ignored in this example.

The 68 gravity reflux is liquefied in a primary condenser, while the 110 gravity overhead goes to a second condenser where liquefaction takes place. The more detailed statement of conditions in the problem is included in the drawing shown below. With temperatures on the outlet of the condensers as shown, the problem is to determine the quantity of heat to be removed. Reflux is wanted at 165°F.

Assume
25 per cent of 110° A.P.I. gr. overhead
75 per cent of 68° A.P.I. gr. reflux

$\frac{25}{56}$ = .446 mols of 110° gr.

$\frac{75}{105}$ = .715 mols of 68° gr.

Total..1.161 mols

Mol per cent of 110° = $\frac{.446}{1.161}$ = 38.4 per cent

Mol per cent of 68° = $\frac{.715}{1.161}$ = 61.6 per cent

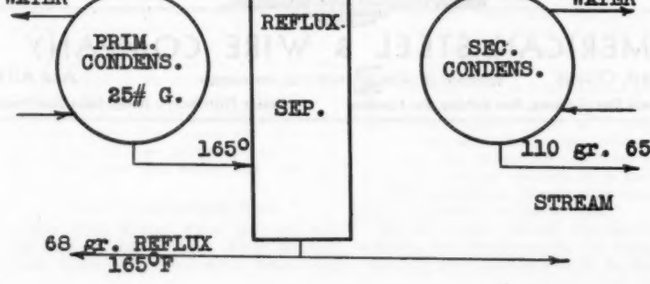
The partial pressure of 68° reflux = .616 × 39.7 = 24.45

Referring to chart, the temperature at which reflux will liquefy in primary condenser is found to be 255°F and the latent heat of condensation is 128 Btu. per pound.

Heat Balance—Primary Condenser

Superheat				
.75 (300 — 255)	.495	(sp. ht.)	= 16.72	B.t.u./lb. mixture for 68 gr. reflux
.25 (300 — 165)	.5	(sp. ht.)	= 16.88	B.t.u./lb. mixture for 110 gr. overhead
Latent heat				
.75 × 128			= 96.00	B.t.u./lb. mixture for 68 gr. reflux
Heat of liquid				
.75 (255 — 165)	.56	(sp. gr.)	= 37.8	B.t.u./lb. mixture for 68 gr. reflux
Total heat.....			.167.4	B.t.u./lb. mixture

(Example continued on Page 99)



This f(P, T) must be determined experimentally from specific volume data.

Equation 2 may be written:

$$v'' - v' = \frac{T}{P}(B - Q)$$

by factoring out $\frac{T}{P}$ and representing the new function by Q. Substituting in equation 1:

$$r = AT\frac{dP}{dT}\frac{T}{P}(B - Q)$$

or $$\frac{dP}{dT} = \frac{rp}{AT^2(B - Q)}$$

Then $$\frac{dP}{P} = \frac{dT}{AT^2}\frac{r}{(B - Q)}$$

Integrating, neglecting for the present change in r with change in T.

$$\log_e \frac{P_1}{P_2} = \left[\frac{1}{T_2} - \frac{1}{T_1}\right]\left[\frac{Jr}{B - Q}\right]$$

Let $P_2 = 14.7$ pounds, and $T_2 = T_N$, the absolute boiling point at 14.7 pounds absolute.

$$\therefore \log_e \frac{P}{14.7} = \left[1 - \frac{T_N}{T}\right]\left[\frac{Jr}{B - Q}\right]$$

Since r is a function of T and Q is a power function of T, the above equation may be written:

$$\log_{10} P = k_1 - k_2\left(\frac{T_N}{T}\right) - k_3\left(\frac{T_N}{T}\right)^2 \qquad (3)$$

where T_N is the degrees F. absolute at 14.7 pounds and T is the degrees F. absolute at P pounds and k_1, k_2 and k_3 are constants for each compound and are functions of the molecular weight. Constants k_1, k_2 and k_3 are determined with experimental data.

Equation 3 was plotted for normal paraffin hydrocarbons on semi-log paper with pressure in pounds per square inch absolute on the logarithm scale as ordinates and the ratio $\frac{T_N}{T}$ as abscissae.

The resulting family of curves is very consistent, all passing through a common point, P = 14.7 pounds absolute and $\frac{T_N}{T} = 1$. These curves are almost straight, having a slight curvature as k_3 is small. By this method experimental data is tested for consistency and accurate extrapolations are made using the most reliable data.

The accompanying chart is worked out with the normal paraffin hydrocarbons as a basis since more data are available on this series. A straight line is drawn which is called one atmosphere pressure. At an angle of 60° to this base line the lines of constant temperature are laid off in parallel equally spaced lines, the temperature range being from —350° to +950° F., each division being 5°. At 120° with this base line straight lines are drawn to represent the normal paraffin hydrocarbons. The point of intersection of this base line is the boiling point at one atmosphere or t_N taken as the most agreed upon value from the literature. The lines are first plotted to represent compound methane to eicosane, inclusive.

(Continued on Page 99)

THREE JOBS for One Company

BADGER engineers have designed, and Badger field forces have recently erected, simultaneously, three pressure distillate atmospheric and vacuum re-run units, varying in capacity from 4,500 to 12,000 barrels per day.

These 3 plants, at 3 different refineries, were for one of the leading refiners, whose decision to entrust us with such an extensive construction program speaks for itself.

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Associated Oil Co.
Penzoil Company
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Tidal Refining Co.
Continental Oil Co.
Anglo-Mexican Petroleum Co. Ltd.
Cities Service Refining Co.
Barnsdall Corporation
Beacon Oil Company
Pierce Petroleum Corp.
Magnolia Petroleum Co. of Texas
New Orleans Refining Co.
Skelly Oil Co.
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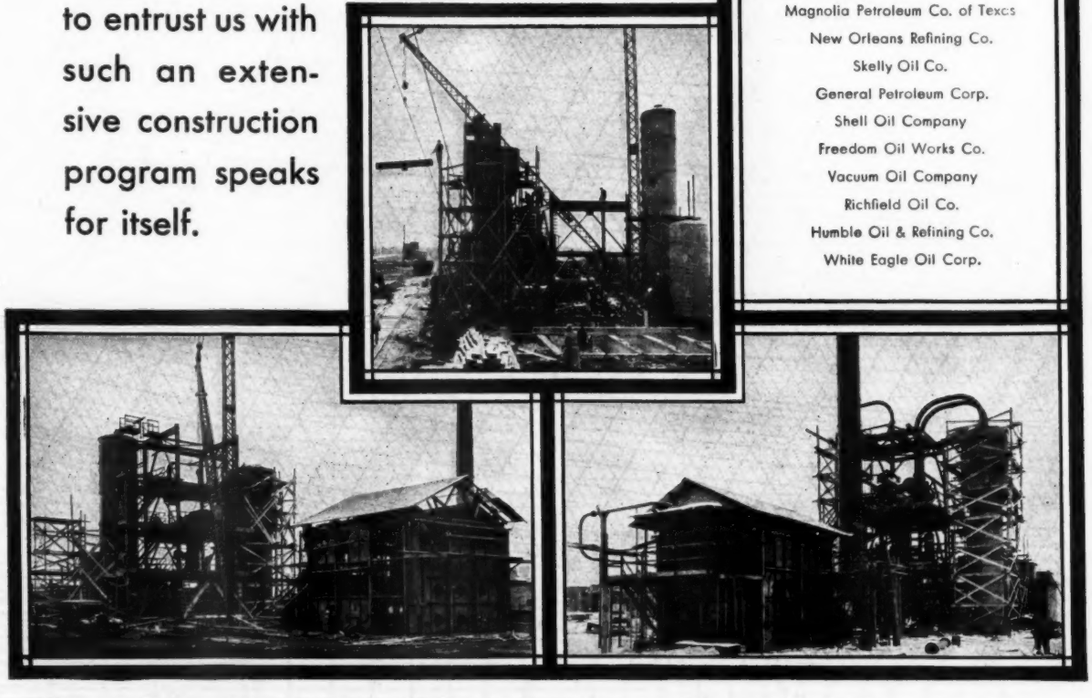

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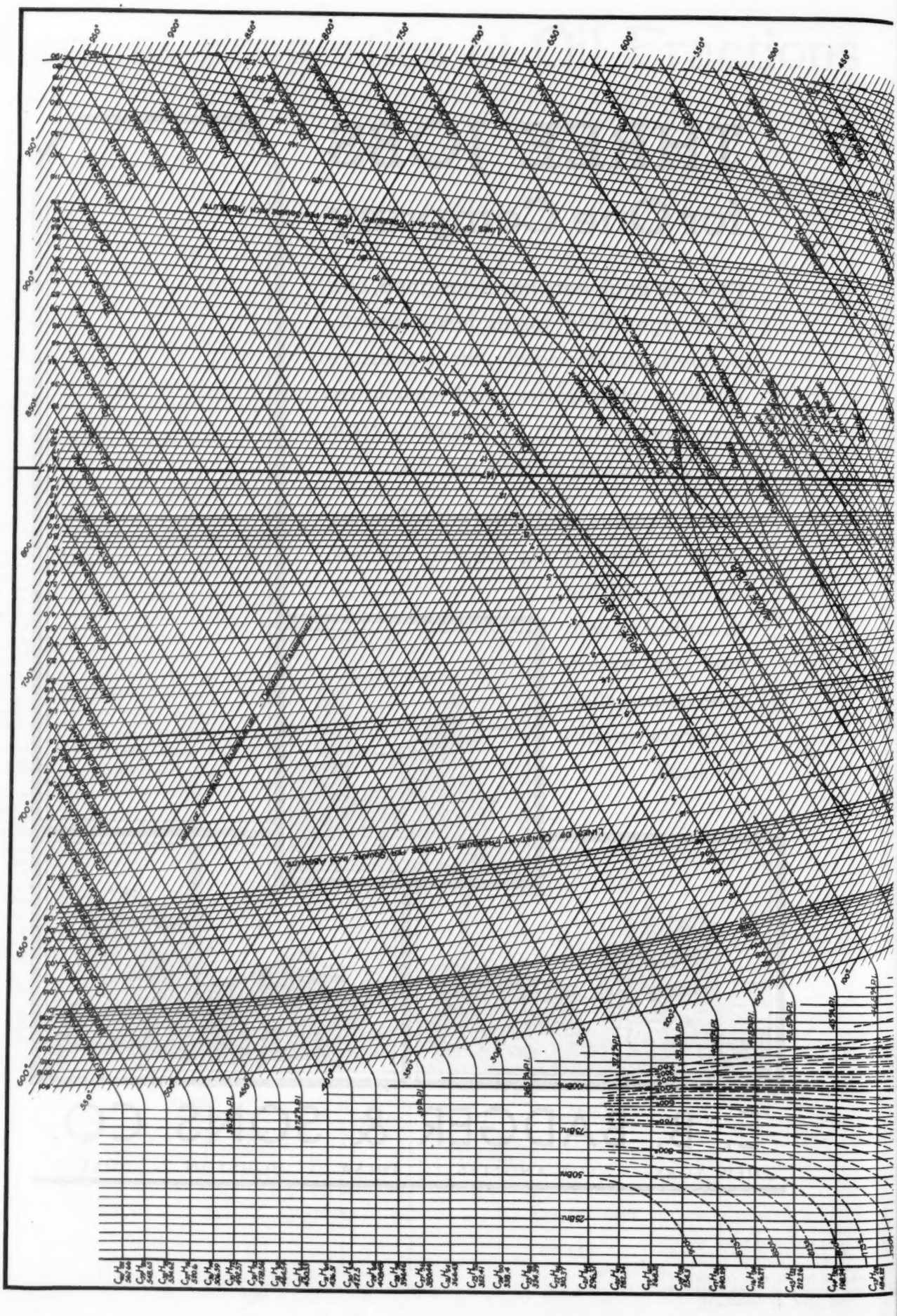

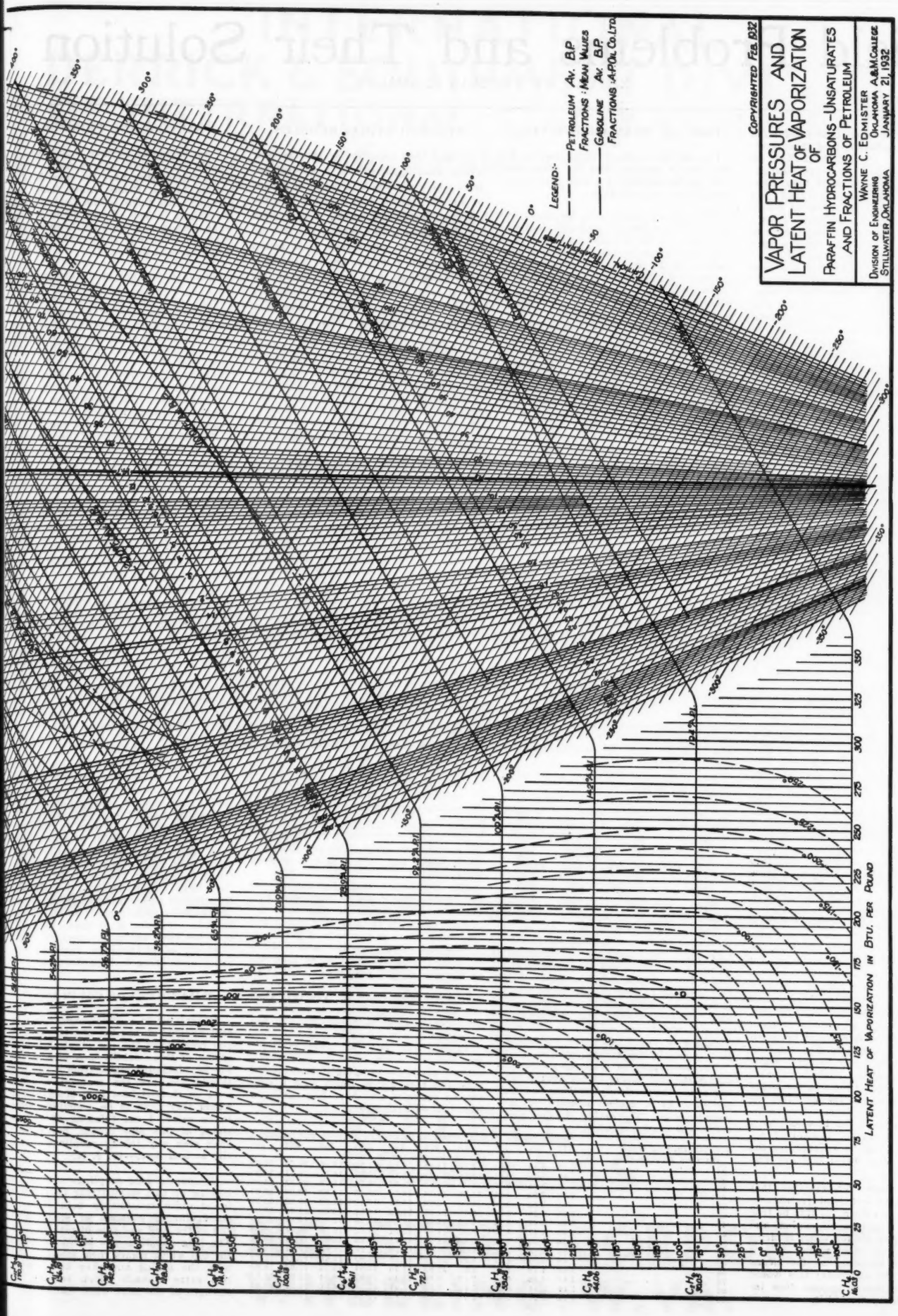
VAPOR PRESSURES AND LATENT HEAT OF VAPORIZATION OF PARAFFIN HYDROCARBONS - UNSATURATES AND FRACTIONS OF PETROLEUM
WAYNE C. EDMISTER
DIVISION OF ENGINEERING OKLAHOMA A.&M. COLLEGE
STILLWATER, OKLAHOMA JANUARY 21, 1932
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LEGEND:-
PETROLEUM AV. B.P. FRACTIONS : MEAN VALUES
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LATENT HEAT OF VAPORIZATION IN BTU. PER POUND

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

CAPILLARY THEORY EXPLAINED

I want to ask the meaning of what is called the capillary theory of oil accumulation in the sand. Is it a theory that is accepted by petroleum geologists?—G. E. K.

The capillary theory of oil accumulation assumes that surface tension will cause oil and water to be drawn into capillary openings, without regard to the force of gravity, as water is drawn into a sponge or as ink is absorbed by a piece of blotting paper. Surface tension is that property, due to molecular forces, which resides in the surface film of all liquids and tends to bring the contained volume into a form having the least superficial area. Particles lying below the film, being equally acted on from all sides, are in equilibrium as to forces of cohesion, but those in the film itself are attracted inward and tension results.

As water has about three times the surface tension of crude oil, capillary action would have about three times as much effect on water as on oil. The constant tendency of capillarity is to draw water into the finer openings, displacing the oil and gas and so forcing them to the larger openings. This theory deals only with the removal of oil and gas from source rocks. If such removal occurred it would be a process of dissemination instead of accumulation. No cause is assigned for the entrance of invading water into the fine-grained sediments.

Experiments have demonstrated that the first liquid to wet sand grains continued to adhere to them. If this be true capillarity would oppose all motion, and it would be impossible for water to drive oil out of shales, or other rocks.

Capillarity is suggested as the means of "sealing up" of oil pools; this would necessitate a resistance against flow instead of a tendency toward it.

PAYS TO HEAT FEED WATER

I would like to have it explained to me just how it pays to heat the boiler feed water in the drilling of a well, that is if it really does pay.—T. E. O.

That genuine savings in fuel costs are effected by preheating the boiler feed water seems to be beyond question. The following answer to your question is provided by R. P. Brouthertin, petroleum engineer with The Texas Company:

Before water fed into a boiler can be converted into steam it must be brought to the temperature corresponding to pressure in the boiler. The temperature of boiling water at 250 pounds gauge pressure is 400° F. This temperature varies as boiler pressure varies. As the temperature of water rises it absorbs heat at the rate of one B.t.u. for each degree Fahrenheit. This is known as the heat of liquid, or sensible heat. After reaching the boiling point a further addition of heat is necessary to transform the water into steam. This additional heat is expended without increasing the temperature of the water and is known as the heat of vaporization, or latent heat. The heat of vaporization at atmospheric pressure requires the expenditure of 970 B.t.u. to change 1 pound of water into steam at the same temperature. At a pressure of 500 pounds only 762 B.t.u. is required to change 1 pound of water into steam; in other words the higher the pressure on a boiler the less fuel is necessary to overcome the heat of vaporization.

The approximate saving in fuel through heating the boiler feed water by means of heat that otherwise would be wasted can be computed by the following formula: Per cent saving in fuel:

$$\% = \frac{100\,(h - h')}{H - h'}$$

H = Total heat in B.t.u. above 32° F. per pound of steam at the boiler pressure.

h' = Temperature of feed water entering the heater.

h = Temperature of feed water after leaving the heater.

Example: Let the gauge pressure of the boiler be 200 pounds: H = 1,194. Temperature = 388° F., and latent heat = 838. h' = 40° F., h = 140° F. Per cent saving of fuel:

$$\frac{100(140 - 40)}{[(388 + 838) - 32] - 40} = \frac{10{,}000}{1{,}154}$$

This percentage should be easily obtained on drilling of wells.

Besides the saving in fuel effected by the use of feed water heaters, the time required for the conversion of water into steam is diminished and the capacity of a boiler is correspondingly increased. Furthermore the feeding of cold water into a boiler has a tendency to set up strains and stresses owing to temperature changes which are reduced as the temperature of the feed water approaches that caused by the steam pressure.

The accompanying table shows the approximate fuel saving in per cent resulting from the various increases in temperature, at a boiler pressure of 200 pounds gauge. The saving at other pressures will vary somewhat.

Temperature of water entering heater—	Temperature of water leaving heater in degrees Fahrenheit— 120	140	160	180	200	220	240	260	280	300
	(Percentage saved in fuel)									
32	7.33	8.98	10.66	12.33	14.06	15.67	17.36	19.06	20.76	22.48
35	7.08	8.74	10.41	12.16	13.75	15.41	17.11	18.81	20.51	22.22
40	6.74	8.33	10.06	11.73	13.42	15.11	16.76	18.51	20.22	21.95
45	6.30	7.99	9.67	11.36	13.04	14.74	16.45	18.08	19.90	21.61
50	5.81	7.60	9.29	10.93	12.74	14.39	16.10	17.82	19.55	21.29
55	5.50	7.20	8.90	10.61	12.46	14.03	15.74	17.47	19.20	20.96
60	5.10	6.81	8.52	10.23	11.90	13.64	15.48	17.13	18.87	20.55
65	4.70	6.41	8.12	9.93	11.56	13.21	15.02	16.76	18.51	20.28
70	4.29	6.01	7.73	9.45	11.35	12.92	14.66	16.40	18.16	19.94
75	3.88	5.60	7.33	9.06	10.80	12.54	14.20	16.04	17.81	19.59
80	3.45	5.19	6.93	8.67	10.40	12.16	13.92	15.68	17.37	19.24
85	3.04	4.78	6.52	8.27	10.02	11.78	13.54	15.31	17.09	18.89
90	2.62	4.36	6.13	7.87	9.63	11.40	13.17	14.94	16.74	18.54
95	2.19	3.94	5.70	7.47	9.23	11.01	12.74	14.57	16.37	18.13
100	1.76	3.52	5.29	7.06	8.83	10.62	12.40	14.20	16.00	17.82

PUZZLED BY GAS BUBBLES

I have been noticing for the last few weeks what apparently is a natural gas seep, which consists of a series of groups of bubbles thrown 3 to 6 inches into the air from puddles of water. I have tried to ignite them with a match, but they do not burn. I do not believe it is marsh gas, although I do not know, but where these bubbles occur it is not marshy. In fact it is in a lane and the bubbles are visible only when the spot where they occur is inundated.—W. J. G.

From your description it is suspected marsh gas as being formed in some underground stratum and when the top soil is moistened the gas breaks through and comes to the surface of the water. The fact that the gas, of whatever kind it is, can break to the surface indicates that there cannot be much of an accumulation underground but rather that it escapes as formed.

The formation conducting the gas to the surface should not be very deep. You might drive a length of pipe into the ground, clean out the soil from inside and find out if there is any body of gas there.

This pipe can be supplied with a sharp point and with holes drilled at intervals in its sides so that gas can enter it after the soil that accumulates in the pipe as driven has been removed. You can wash out the pipe with water and a home-made swab. It it is where you can use a hose, that would be still better.

In this way you can make a simple test without much expense. If the volume of gas is encouraging it is suggested that you then get in touch with a consulting geologist and have him make an examination and report.

WHY WAS IT CALLED THAT?

BELT THEORY

The belt theory, as it was called when announced by Cyrus D. Angell, early Pennsylvania oil operator, conceived petroleum deposits as lying in clearly defined belts or strips, which were likely to be long and relatively narrow. Mr. Angell arrived at his theory through study of the course which productive wells were marking along Oil Creek and the Allegheny River. He became convinced that such a belt ran from Petroleum Center to Scrubgrass in Venango County, and acting upon his conviction he leased or bought all available land which he believed within the limits of this belt for a distance of 6 miles between Foster and Belle Island. Ninety per cent of the wells which he drilled on the strip were profitable producers. He followed up his theory farther south with equally satisfactory results.

SALTING AND FREEZING

I am beginning to have a good deal of trouble as a result of gas wells salting up. I believe they have the same kind of trouble in the Pennsylvania fields and perhaps other fields in the East. I would be obliged to you if you could tell me what methods are employed in these older fields to clean out these wells that get salted up.—A. E. O.

Operators in many of the old gas areas of Pennsylvania, especially in Butler County, encounter the same trouble you are having, the salt water gradually encroaching upon the wells and flowing out with the gas. Similar trouble is met in some parts of Kentucky, Ohio, West Virginia and New York. The salt water gradually crystallizes on the face of the sand and is carried into the tubing, causing salt arches. The information you request concerning methods employed in cleaning out such wells is supplied by S. W. Meals, president of the Carnegie Natural Gas Co., Pittsburgh, Pa., who is familiar with practices in that region. He writes:

"The most common method of cleaning wells which are salted up is to run a barrel or two of fresh water into the well and allow it to stand for a few hours. After the salt bridge is dissolved the well is bailed dry. Usually one or more applications of fresh water is sufficient to open up the well.

"If the obstruction in the liner or tubing is serious, and particularly in wells of large volume which make heavy deposits of salt for considerable distances on the inside of the tubing, it is necessary to remove these deposits with a small string of cleaning-out tools which are run inside of the tubing. In some instances it is necessary to remove the tubing and replace part of the string with new tubing. If the face of the sand becomes seriously clogged it is often necessary to shoot the well to clean the face and establish new drainage lines.

"The salting of wells in the eastern fields is not serious because, when monthly readings indicate that production is falling the well is immediately cleaned and bailed out. When a well suddenly declines in pressure it is shut in and pressure readings are taken at short intervals. Wells which produce small volumes of gas with high rock pressure sometimes freeze. Operators have abandoned wells that have frozen because they thought the gas had been exhausted. When a well freezes it is usually shut in for a short time in order for it to thaw out. If it does not thaw out it is necessary to run a string of cleaning-out tools or even shoot it to bring back production."

WHAT KIND OF COUPLINGS?

In replying to a correspondent in a recent number of The Oil and Gas Journal you recommend the use of an 1,800-foot spring of three-eighths inch pipe or tubing for siphoning water from a gas well. Would you use the common couplings used on three-eighths inch black pipe or would they have to be something better to be safe? I am thinking of using a string of this pipe myself, but I never have seen any tubing couplings in this size around here.—W. J. H.

If common long couplings are used in making up this small string they will be found quite satisfactory both from the standpoint of strength of string when run in the well and ease of making it up. The long couplings are belled in around the top which makes them easier to stab with the tubing and they have one or two extra threads which increase the strength of the joint when made up.

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Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas, and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

GAS MADE WHEN CRACKING

What is the general practice for finding the volume, cubic feet, of gas obtained from a barrel of oil when it is treated in a cracking still?—R. McD.

The quantity of gas that may be given off when an oil is cracked will vary with the oil and the process. There is not only a difference in the yield of gas according to the nature of the charging stocks and the conditions of the cracking process, but the composition of the several hydrocarbons present in the gas may be varied by slight changes in operating conditions.

The larger or more complex molecules of the paraffin hydrocarbons are the more difficult to convert entirely to gas due to the tendency to form coke and conversion products, which may be both solid and liquid, than the lower and lighter compounds. It has been assumed that the hydrocarbon liquids of the gasoline range will, if entirely changed to gas, yield from 1,360 to 1,470 cubic feet per barrel. If it were possible to obtain a similar conversion by the decomposition of a gas oil the maximum yield of gas would be 395 cubic feet per barrel, when reduced to 60° F.

The yield of gas from the many varieties of oil distilled in the refinery, and including cracking, is reported from 50 to 800 cubic feet per barrel, when the pressure ranged from 100 to 150 pounds and the temperature from 800° to 850° F.

Morrell and Egloff report, in U.O.P., Bulletin 97, the gas production from fuel oils of various origin, from 15.6° to 26.1° A.P.I., to range from 620 to 865 cubic feet per barrel. A 38.8° A.P.I. gas oil from Pennsylvania oil produced 570 cubic feet. Heavy crude oils 13.7° to 15.4° gravity, gave from 838 to 874 cubic feet per barrel. All of these yields were obtained by cracking the charging stocks mentioned.

No definite rule can be laid down for making an estimate of the gas yield on the basis of the physical or ordinary properties of an oil. When data based on experience are not available, the safe practice is to make an actual determination of gas volume by means of a run in a small laboratory cracking still.

CONTACT PROCESS AND PERCOLATING FILTERS

I would like to become a little more familiar with the contact process of acid treating bright stocks. If you would please outline this procedure and define percolating filtering, I would appreciate the information.—E. G. G.

The percolating filter is one in which the filtering medium is placed in a cylindrical upright tank; the discoloration being the result of the oil passing downward through a bed of the decolorizing agent. The filter tanks are usually of small diameter, as related to length, requiring the oil to pass through 10 to 20 feet of the material. The depth of the filter bed may vary with the properties of oil to be filtered, the character of suspended materials, the kind of dissolved impurities, and the final color desired.

Some filters are fitted with steam coils, or steam jackets, so that the oil may be filtered hot. A high temperature is essential when tarry material or wax is present, also if the oil is of high viscosity. As a rule more loss of color is obtained at the lower temperatures than at the higher, and cold filtering is practiced when making special products with little or no color.

Many adsorbing materials are used in the percolating filters but the agents suitable for filtering after contacting with acid are not so numerous. Morrell and Egloff give a comprehensive list in The Oil and Gas Journal, January 28, 1932, page 22. Various earths and minerals including fuller's earth, china clay, kaolin, bauxite, magnesite, iron oxide and the oxides of the alkaline earths. Additional materials are bone ash, bog iron ore, Death Valley clay, bentonite, silica gel; also several carbonaceous materials including bone-black, wood charcoal, blood charcoal and other special charcoals.

The contact "clays" are usually prepared by treating the natural mineral with sulphuric or hydrochloric acid, removing the excess acid together with the products of the reaction, by repeated washings with water, finally drying and grinding. A few of the natural deposits possess the adsorptive property to such a remarkable extent that the acid conditioning is not required. The action of the acid results in the removal of some calcium and magnesium compounds, especially the carbonates, together with organic matter. Certain changes in molecular structure follow. The washing out of the salts, etc., and the drying produces an open structure with many minute cells so that a very porous mass favorable for decolorizing is obtained.

The treatment of a lubricating stock with sulphuric acid in the contact process is similar to the older agitator method, with the important exception that somewhat smaller quantities of acid are used and neutralizing washes of caustic soda are not applied. The oil is treated with the required quantity of strong sulphuric acid, then, after a short settling, is transferred to another agitator and, while being mechanically agitated, the activated clay is added. The quantity of clay will vary with the stock and the quality of the clay may range from 10 to 40 pounds a barrel of oil when treating bright stock.

While being agitated with the clay the oil is maintained at an elevated temperature but in no case should this temperature be closer than 10 degrees to the flashpoint, and 20 degrees is safer. After this contacting has continued for about 30 minutes the mixture is pumped through a plate filter, where the clay and carbon will be retained on the plates as a cake and the clear oil will flow from the outlets. The several variables to be considered must be brought under control by means of preliminary experiments made on a small scale.

The advantages of the contact process for treating lubricating oils include rapidity of the operation, the fact that higher temperatures may be used than with the older process, resulting in a reduction of the quantity of acid, reduction in the tendency of the finished oil to emulsify and brighter colors.

PRICE QUOTATIONS APPLY AT SOURCE

We see that the oil quotations in The Oil and Gas Journal are at New York. Does this mean that the prices quoted are prices at New York or at the refinery plus freight? For instance, a 200 vis. 5-6 color red oil is quoted from the Gulf Coast at $0.0675 per gallon. Is that f.o.b. New York, or at the refinery plus freight?—W. M.

Except when otherwise indicated, the selling prices for petroleum products are f.o.b. at the refinery for tank car lots. The price quoted in most instances is per gallon, but wax is sold by the pound and fuel oil by the barrel.

The price table under Pennsylvania means that the products named are obtainable in tank car lots at refineries located in the Pennsylvania district for the quoted prices. The prices on Gulf Coast oils apply at the refineries located in the Gulf Coast area.

Certain products are quoted at Chicago with reference to the cost at Oklahoma refineries; meaning that the selling price at Chicago is the Oklahoma refinery price plus the freight to Chicago. The New York prices are for the products at Bayonne, N. J., refineries and at other plants in the vicinity of New York.

ZINC CHLORIDE FOR TREATING GASOLINE

Will you kindly advise where we may secure data on zinc chloride as applied to the desulphurizing of pressure distillate? Also grades commonly used and the results obtained? Advise if there are any publications on the manufacture and use of zinc chloride in oil refining.—O. B. B.

Zinc chloride is a chemical salt made by the treatment of zinc with hydrochloric acid in the presence of water. The solution obtained after the reaction is evaporated to a solid residue and this is fused by heat. The salt as it appears in commerce contains acid and when added to water gives a solution which reacts acid, because of excess hydrochloric acid. Probably the largest use for zinc chloride has been in the treatment of wood to preserve it from decay and attack due to the growth of organisms and destructive insects. Large quantities are used for the preservation of wood used in railroad construction. Zinc chloride is readily obtainable on the market.

The method of applying zinc chloride to the treatment of gasoline has been fully described by Arthur Lachman, in The Oil and Gas Journal, November 12, 1931, page 30. This is a vapor phase operation in which the vapor or gas to be purified is passed through a hot solution of the salt. The chloride treater may, as suggested by Lachman, be placed between the fractionating column and the condenser or the gasoline may be treated in a separate system.

Normally the treating temperature may range between 302° and 347° F., although these extremes may be changed by the character of the material under treatment. The zinc chloride is used in solution which may vary from 70 to 85 per cent by weight. The vapors are moving at a rapid rate so that the time of contact is measured in seconds; two seconds being enough in some instances and 12 seconds is the longest time that has been found necessary. The mixing of the vapors and the solution is accomplished by means of towers filled with various sorts of packing, as well as bubble cap plates.

The rapid action permits the use of relatively small equipment; a unit having a daily capacity of 5,000 bbls. has a volume of only 1,100 cubic feet. The treating of a pressure distillate gave the results shown in the table.

ZINC CHLORIDE TREATING RESULTS

Inspection—	Raw	Finished
Gravity, A.P.I.	53.2	55.9
Initial, °F.	99	90
10 per cent	165	153
50	297	280
90	395	377
95	413	395
Endpoint	437	407
Gum, copper dish	290 mg.	3 mg.
Sulphur, per cent	0.28	0.19
Mercaptans, molar	0.017	0.007
Color		30

The average reduction of the sulphur content is from 25 to 40 per cent. The above treated stock is still sour but showing the percentage of mercaptans reduced. Total removal is a function of time, and while it is possible to make a sweet product by this method, it is cheaper when working with cracked products to complete the operation by means of the regular sweetening method.

An important consideration is that the data show no reduction of the octane number and that the gum and color stability of the finished gasoline is excellent; no change being noted in a tanker delivery at the end of 30 days.

The fundamental reactions of the zinc chloride result in the formation of zinc sulphide, from either mercaptans of hydrogen sulphide. The quantity of zinc chloride fed into the system may vary from 1 to 10 pounds per barrel of the distillate, with a discharge of the spent liquid once per shift, or a net consumption of 0.1 to 0.3 pound per barrel treated. Hydrochloric is a product of the reaction and may be controlled by injecting sodium hydroxide solution or ammonia into the tower or the vapor line before it enters the condenser.

The recovery of the zinc chloride is simple. The spent liquid is diluted with water to a strength of 50 to 60 per cent and allowed to settle, the zinc chloride settling as a heavy liquor is drawn off for reuse, with or without reconcentration according to the demands of the feeding system.

HEAT TRANSFER IN HEAT EXCHANGERS

We would appreciate information as to where we could get some books that deal more or less specifically with heat exchangers as used in the refinery which show some computations as to heat transfer in heat exchangers.—M. N. C.

The subject of heat exchangers is explained in Day's Handbook of the Petroleum Industry, Vol. 2, page 181. A description of an actual example with the operating data is given on page 388. It is suggested in this book, footnote page 183, that 10 to 15 B.t.u. per hour per square foot per degree of mean temperature difference, has been found to be the most practical basis for exchanger design.

A mathematical discussion of the flow of heat is to be found in Principles of Chemical Engineering, by Walker, Lewis and McAdams, published by McGraw-Hill Book Co., New York.

Day's Handbook is published by John Wiley & Sons, New York.

Personal Paragraphs About Oil Men

D. R. Smith, district manager, Wright Manufacturing Company, St. Louis, Mo., spent several days in Tulsa last week.

* * *

J. M. Crawford, president of the Parkersburg Rig & Reel Company, Parkersburg, W. Va., is making a trip through Texas.

* * *

Ralph Cummins, of the Southland Royalty Company, Fort Worth, Tex., has been ill in a Fort Worth hospital, but is better.

* * *

W. H. Cramer, of Newark, Ohio, eastern division manager of the Jarecki Manufacturing Company, recently visited H. A. Corbin, manager at Mount Pleasant, Mich.

* * *

Will J. Reid and George Williams were recently re-elected president and vice president respectively of the Hancock Oil Company of California at the last annual meeting.

* * *

Charles C. Kelly, of Chicago, secretary-treasurer of the Natural Gas Corporation of America, operating the gas line from Northwest Texas to Chicago, has been in Bartlesville, Okla.

* * *

Harry H. Power, production engineer, Gypsy Oil Company, Tulsa, has been in the East visiting the Gulf Oil Company's office, Pittsburgh, Pa., and the A.I.M.E. meeting in New York City.

* * *

Ralph Walkingstick, former president of the Mid-Continent Land Men and Scouts Association, has returned to the service of the Tidal Oil Company as a scout and field man, with headquarters in Tulsa.

* * *

John A. Brown, president of the General Petroleum Corporation, was re-elected president of the Kettleman North Dome Association at the association's first annual meeting held in Los Angeles, Calif.

* * *

J. R. Pemberton, former manager of field operations for the Petroleum Securities Company, has returned to Los Angeles, Calif., following a cruise to southern waters in his Diesel boat with a party of scientists.

* * *

C. R. Hetzler, vice president of the Mountain Fuel Supply Company and superintendent of the Uinta Pipe Line Company, with offices in Rock Springs, Wyo., was a business visitor in the offices of the Ohio Oil Company at Casper, Wyo., recently.

* * *

H. M. Stalcup, vice president in charge of production, and R. T. Lyons, vice president in charge of land and leasing of Skelly Oil Company, have returned from a fortnight's motor trip over Skelly properties in Kansas, Oklahoma, Texas and New Mexico.

* * *

John D. Clark, of Cheyenne, Wyo., at one time president of the Midwest Refining Company with Denver, Colo., offices, has been elected a director of the American National Bank in Cheyenne. Mr. Clark formerly was a director of this institution but resigned some years ago when his work required his presence in the East. Mr. Clark is at the head of the department of economics at Denver University.

* * *

Harry A. Kidder, superintendent of motive power of the Interborough Rapid Transit Company, New York, has been elected president for 1932 of the United Engineering Trustees, joint agency of the four Founder Engineering Societies. Harold V. Coes, consulting management engineer of Ford, Bacon & Davis, and Colonel Arthur S. Dwight, president of Dwight & Lloyd Companies, were named vice presidents. Dr. Alfred D. Flinn, director of the Engineering Foundation, will serve as secretary, and Clifford P. Hunt, vice president of the Chemical Bank & Trust Company, as treasurer.

Russell S. Knappen, Gypsy Oil Company, Tulsa, is in Pittsburgh, Pa.

* * *

H. Taubman, of the Taubman Supply Corporation, has returned from a business trip to various points in the Texas oil fields.

* * *

S. E. Williams, of Tulsa, headed a party of men who inspected the Broomfield Township gas area of the Mount Pleasant, Michigan, Field.

* * *

J. E. (Jack) Hough, who recently returned from California, is now in Tulsa where he is office manager for the Reiter-Foster Oil Corporation.

* * *

Don Allen Curtis, of Jamestown, N. Y., president of the Empire State Oil Company, Casper, Wyo., has been visiting the Wyoming offices.

* * *

J. Clifton Hackett has returned to Petrolia, Ontario, on sick leave from Peru, where he has been on the staff of the International Petroleum Company.

* * *

Harry W. Conley has returned to Casper, Wyo., after a trip to Denver, Colo., in conference with officials of the Kinney-Coastal Oil Company of which he is the superintendent of operations.

* * *

L. Mittelman, chief chemist of the Associated Oil Company, Avon refinery, Associated, Calif., has been appointed a member of the American Petroleum Institute's Committee on Disposal of Refinery Wastes.

Men of the Industry

H. R. Dickerson

Rising rapidly from his job as a pumper, H. R. Dickerson, general superintendent of the Arkansas Natural Gas Corporation, is today among the leaders in his line. His first association with the oil and gas industry began in 1911 and he served successively as a pumper, driller, lease foreman and pipe line foreman. He has been connected with The Texas Company, Gulf Refining Company, and Louisiana Oil Refining Corporation in various capacities.

In 1921 Mr. Dickerson went to Arkansas, taking charge of the Natural Gas & Petroleum Corporation. He was with that organization when it was taken over by the Doherty interests and its name changed to Natural Gas & Fuel Corporation. Later Mr. Dickerson was made general superintendent of operations of the Arkansas Natural Gas Corporation.

Brooks Gutelius, president of the Continental Supply Company, St. Louis, Mo., was in Tulsa last week.

* * *

C. E. Cranston, of the Kettleman Oil Corporation, has been elected a director of the Kettleman North Dome Association.

* * *

Clarel B. Mapes, assistant secretary, Mid-Continent Oil and Gas Association, Tulsa, has just returned from a trip to Texas.

* * *

Pierre Dessus, general secretary of the Standard Franco-Americaine, has been made a Chevalier of the Order of the Legion of Honor.

* * *

G. C. Hollingsworth, district land man for the Empire Gas & Fuel Oil Company at San Angelo, Tex., made a trip to San Antonio, Tex., and points on the Gulf Coast.

* * *

A. R. Wilson, vice president and division manager of The Texas Company, accompanied by Y. A. Land, attorney for his company, were in Casper, Wyo., from their Denver, Colo., offices.

* * *

William Dawson, formerly with the Frick-Reid Supply Corporation at Mount Pleasant, Mich., has returned to his home in Virginia for a visit. R. R. Boyer is now stationed with the Frick-Reid corporation at Mount Pleasant.

* * *

H. Paul Grimm, formerly California state oil umpire, has been elected president of the Pacific Western Oil Company, succeeding William C. McDuffie, who became chairman of the board at the regular annual meeting.

* * *

R. S. Shannon, general superintendent, Rocky Mountain division, Continental Oil Company, with offices in Denver, Colo., was in Casper, Wyo., to attend a conference between major producers and officials of the U. S. Geological Survey.

* * *

Capt. Frank M. Hawks, aeronautical adviser, and J. D. (Duke) Jernigin, superintendent of aviation for The Texas Company, have returned to New York after completing a company inspection flight over the Transcontinental & Western Air System.

* * *

Robert C. Wallace, formerly with Cosden & Company, and with the Floridin Company for the past nine years, lives at Quincy, Fla., where he is chemist for the company and thinks fullers earth all the time. He is very proud of the little daughter who is now 7 years old.

* * *

Frank W. Bird has been promoted to assistant general manager of Montana Power Company. Mr. Bird has been an executive of the company for many years, and has been a resident of Montana since 1903. His promotion was announced by Frank M. Kerr, vice president and general manager.

* * *

W. A. J. M. van Waterschoot van Der Gracht has been appointed temporary director of The Netherlands Bureau of Mines, beginning May 1, for purposes of organization until the regular official is appointed. He will have an office at Maastricht, Holland, care of Staatstoezicht op de Mynen, and will direct government activities connected with the coal mines, labor and safety regulations, concessions, etc. During this winter Doctor van Der Gracht is making his home in Washington, D. C.

* * *

J. M. Pritchard, vice president of McColl-Frontenac Oil Company, of Toronto and Montreal, and previously in charge of sales in the eastern and maritime divisions, has been appointed to the new position of general sales manager. In 1923 Mr. Pritchard organized and became vice president and managing director of the Tidioute Refining Company of Canada which was later absorbed by the Frontenac Oil Company, subsequently amalgamated with McColl Brothers.

Natural Gas Industry Developments

PAMPA GAS HEARINGS MAY LEAD TO NEW LAW

AUSTIN, Tex., Feb. 22.—Legislation may be necessary to correct waste of natural gas in the Panhandle fields, it developed following a hearing by the State Railroad Commission at Pampa.

Returning from Pampa, Chairman C. V. Terrell declared the situation was one of the most perplexing the commission had ever been called upon to solve. He said pipe lines from the Panhandle natural gas fields are transporting both gas and gasoline out of the State, to Chicago and other eastern points, tax free, and that these lines refuse to take the gas ratably as provided by state law, on the ground that they are beyond the jurisdiction of state regulation because engaged in interstate commerce.

Because these lines are taking only from their own wells or affiliated wells, scores of independent producers in the field are without pipe line outlets. These producers, therefore, are converting their gas into carbon black. To close in independents who are wasting gas, Mr. Terrell explained, would be to virtually destroy their property, since the gas on their leases would be drained by the companies with pipe line outlets. On the other hand the waste in the field demands remedial measures.

Don Emery, counsel for the Phillips Petroleum Co., declared that enforcement of the oil and gas ratio in the Panhandle Field likely would force the closing of 165 wells and the discharge of 4,500 workmen. Moreover, he said gasoline plants also would have to close. Mr. Emery accused one natural gas company of working for enforcement of the ratio so it would not have to take gas under terms of the new state conservation statute.

Mr. Emery outlined a plan submitted by the Phillips company for the solving of the vexing question of the proper disposal of 470,000,000 feet of gas now being allowed to blow off in the air.

Mr. Emery stated that the Phillips company at this time was responsible for 130,000,000 feet of this amount of gas going into the air and that if the major pipe line companies would agree to take one-half of this gas or 65,000,000 feet, the Phillips company would agree to shut off the other 65,000,000 feet meeting the gas pipe line companies half way and foot for foot. In making this proposition Mr. Emery also agreed the Phillips company would waive all legal rights to contest any decision or order the railroad commission would make, but in the event it was not agreed to and the order came from the commission to shut off this gas anyway, the Phillips company would fight the case in the courts even taking it to the Supreme Court of the United States before submitting to what he termed the economic ruin of his client.

Other witnesses said much of the waste was "legal rather than economic, because the remedy would be worse than the disease." Practically all were opposed to enforcement of the oil and gas ratio.

Various plans for reducing gas wastage were heard. One suggestion was to reduce takings at gasoline plants; another, to increase the tax on gas taken from the State by pipe lines but to exempt residue gas so as to create a market for the latter. Co-operation of oil interests rather than state compulsion was urged.

Mr. Terrell would not predict how the situation would be cleared up, or what action the railroad commission would take. He pointed out that gas was purchased in the Panhandle at 2 cents and sold at destination for $1.50.

On the strength of the chairman's report, it was freely predicted that drastic action would be taken by the next legislature against the interstate carriers, unless they remedy conditions by their own volition before the legislature meets.

Although the legislature cannot interfere with interstate commerce, its authority to tax has no such inhibitions, it was pointed out.

Attorney General James V. Allred authorized the statement that checking of testimony in the Illinois gas rate increase hearing will continue while his department will find out whether the exporters of Texas gas agree without a suit to paying the Texas state tax on its actual value basis.

If such an agreement is not reached, the question of a suit to establish the actual value basis for taxation will be developed in further evidence, he said.

His comment followed a report of Attorney General Maurice Cheek that exporters claim a cost of 6 cents at the well while offering the State tax on a 2½-cent basis.

KANSAS INQUIRY ENDS BUT DECISION REVERSED

TOPEKA, Kans., Feb. 22.—The investigation by the Kansas Public Service Commission into the gate rate charge of the Cities Service Gas Co. was concluded here after sessions that covered 35 days. The commission announced it would take the case under advisement for 60 days, and would require the filing of briefs by the state and the Doherty interests at the end of that time.

That will mean no effective order on gas rates for the companies will be made by the commission before April 16. If study and consideration is to be given to the briefs which are to be filed by that date, it is probable the commission will not reach the point of issuing an order before May.

OHIO GAS RATE CASE

COLUMBUS, Ohio, Feb. 22.—The Springfield Gas Co. has appealed to the Public Utilities Commission from an ordinance passed by the Springfield City Council fixing the gas rate for the next 2½ years at 48 cents per 1,000 feet. The present rate is 60 cents, and the new rate was to have become effective on February 15.

On the company's election to continue charging the 60-cent rate during pendency of the case, the commission required $85,000 initial bond from the company. Assignment of the appeal for hearing has been deferred pending the making of a joint valuation of the property and audit of the company's receipts and expenditures.

COVINGTON CONTRACT

The municipally owned gas distribution system at Covington, Okla., has been leased for three years to C. E. Knox to supply gas service at 45 cents per 1,000 feet. The city will receive 5 cents per 1,000 feet rental whether gas bills are paid or not. Under his former contract, Mr. Knox furnished gas at 35 cents per 1,000 feet, but did none of the collecting or repairing of the lines. Owing to uncollected accounts the city was suffering a loss under the former contract.

EFFECT OF APPLIANCE BAN

A resolution has been adopted by the Kansas Press Association in Wichita urging repeal of the Kansas law prohibiting the sale of merchandise by utilities, saying merchandising formerly done by utility companies was now going to mail order houses instead of to local stores. A similar law is in effect in Oklahoma.

COURT TEST INDICATED IN LONE STAR RULING

A court test of Oklahoma's right to force the Pennsylvania holding company for the Lone Star Gas Co. to produce its records for scrutiny is indicated. A motion to dismiss a summons against the Lone Star Gas Corp. of Pittsburgh, Pa., to produce records in the hearing before the Oklahoma State Corporation Commission on rates charged by its subsidiaries in 26 Oklahoma cities was overruled at a hearing in Oklahoma City.

Paul A. Walker, chairman of the commission, and C. C. Childers, the other Democratic commissioner, joined in overruling the motion and the summons, issued through the secretary of state, was allowed to stand.

E. R. Hughes, Republican commissioner, voted to dismiss the summons, declaring that "hereafter no utility will get my vote for a rate increase unless it has all its books and records in this state."

Chairman Walker declared legislation may be necessary next winter to cure conditions which he said exist, allowing a holding company of several utilities doing business in the state to disobey a commission order to bring its books in for scrutiny.

MURRAY SUIT DISMISSED

Governor Murray's suit for receivership and ouster of the Lone Star Gas Co. and three subsidiaries was dismissed in Jefferson County District Court at Waurika, Okla., by Judge Eugene Rice.

The judge dissolved a temporary receivership order he had issued against the companies, the Lone Star, Community Natural, Meridian and Guthrie Gas Service, and announced he would decline to forfeit other charters and drive them from Oklahoma.

In sustaining a demurrer to the evidence, Judge Rice did not allow the case to reach a jury. He held reports introduced by attorneys for Governor Murray as false reports were matters for action by the corporation commission and the State Tax Commission.

DOMINION GAS OFFICERS

NEW YORK, Feb. 22.—Frank T. Hulswit, president of the American Commonwealth Power Corp.; David A. Belden, vice president; and Albert Vermeer, secretary, have resigned from the board of directors of Dominion Gas & Electric Co., Canadian utility group controlled by American Commonwealth. These vacancies and another that has existed for some time will be filled by H. J. Briggs, Herbert L. Nichols, Ralph P. Buell and E. A. Harden.

CITY SYSTEM TEST

AUSTIN, Tex., Feb. 22.—The Attorney General is to decide whether a municipality has the right to issue bonds for the construction and operation of a gas distribution system. It is the first time question has been put up to the attorney general. It was presented in an application by Memphis, Hall County, seeking approval of $65,000 of city bonds for the construction and operation of a city gas system.

COUNCIL BLUFFS CONSUMPTION

During the year that natural gas has been in use in Council Bluffs, Iowa, the daily consumption has increased to 2,250,000 feet compared to the use of 750,000 feet of manufactured gas during the preceding year. This is three times as much in quantity, attributed chiefly to industrial use and to house heating installations.

HOCKENBEAMER REPLIES UPHOLDING USE OF GAS

LOS ANGELES, Calif., Feb. 20.—A. F. Hockenbeamer, president of the Pacific Gas & Electric Co., replying to a resolution by the Los Angeles County council of the American Legion, urging state authorities to curtail the production of natural gas on the ground that it is being used as a cheap substitute for other fuels in San Francisco and Los Angeles and occasioning loss of employment to oil workers, said:

"It seems to me this resolution takes account of only a small section of the economic situation, and I ask you to consider these facts: (1) Natural gas has already attracted a number of industries to California, and with the revival of business will, undoubtedly, bring more factories here. This has already increased and will continue to increase employment. (2) Considerable drilling has been, and will probably continue to be done in an increasing degree, with natural gas as its main objective. This has given, and will continue to give, added employment to oil workers. (3) The introduction of natural gas into northern and central California by the Pacific Gas & Electric Co. is resulting in the saving of at least $10,000,000 per annum to fuel users in the territory north of Bakersfield. This company and its subsidiaries have at present approximately half a million domestic consumers of natural gas. Their bills, compared with what they were paying for manufactured gas only a short time ago, have been cut in two. This saving in household budgets came at a time when wages and incomes had been reduced by the business depression and the family dollar had to be stretched to the limit. In other words, during the past 12 months, with the depression at its worst stage, the householders all over our territory, from Bakersfield north, had approximately $10,000,000 more to expend for other necessities of life. It can almost be said that the effect of this on our general economic situation was equivalent to paying out $10,000,000 more for wages.

May I say, further, that this company, whose interests and the interests of its half a million gas consumers would be adversely affected if its supply of natural gas were curtailed and it could only render an intermittent service, has endeavored to do its full share in alleviating economic distress during the past two years. It has, during that period, expended close to $80,000,000 for new construction. This is entirely aside from its ordinary operations, which have been conducted in a normal way without curtailment of forces or cutting of wages. It has meant employment for thousands of workers directly on the jobs, and to many thousands of others employed in establishments producing the materials, supplies and machinery required for the construction of its new plants and the extension of its facilities.

For the coming year the company has tentatively adopted a construction budget of approximately $31,000,000.

In promoting the general economic welfare, one sound enterprise is worth a dozen that are cripples. Why try to add to the crippled industries? The country is already full of them."

UTILITIES CONVENTION

Utility appliance merchandising will be among subjects to be presented at the fourteenth annual convention of the Oklahoma Utilities Association at Tulsa, March 8 and 9, according to E. F. McKay, association manager. Principal address will be by William Parkerson of Tulsa, general commercial manager, Public Service Co. of Oklahoma.

16-inch Naylor *SPIRALWELD* Pipe, 30-foot lengths, laid in Texas

The NAYLOR Structure

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No pipe is exactly the same as Naylor SPIRALWELD Pipe, because structure is the basic principle that distinguishes Naylor SPIRALWELD Pipe from all other pipe. Only Naylor SPIRALWELD Pipe is made with an electrically welded spiral lock-seam truss, which makes possible a mechanically correct structure providing the following FIVE greater pipe values:

STRENGTH.. the highest proportion per pound of weight ever built into a pipe structure.

LIGHT WEIGHT.. because of the added strength provided by the spiral lock-seam truss, Naylor SPIRALWELD Pipe is being used for the same pressures as standard weight wrought pipe—yet it weighs one half as much.

FLEXIBILITY.. throughout each length which provides for expansion and contraction. (No expansion joints are required in Naylor SPIRALWELD Pipe lines.)

WELD STAMINA.. the principal function of the Naylor WELD is to seal the pipe leak-tight. The Naylor spiral lock-seam truss relieves the weld of expansion and contraction strains.

PERFECT ROUNDNESS.. wound on a turned mandrel and rigidly held in formation by the spiral lock-seam truss running the entire length of the pipe. This construction assures a pipe of absolute diameter.

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2301 Commerce Street

DALLAS: 305 Magnolia Building

LOS ANGELES: Champion & Barber, Inc., 576 Subway Terminal Building., Exclusive Distributors: California, Nevada and Arizona

MONTREAL, CANADA: Mechanical Equipment Company, 660 St. Catherine St., West
VANCOUVER, B. C.: Gordon & Belyea, Ltd., 101 Powell Street
MARACAIBO, VENEZUELA: Patrick H. Heaney, Apartado 298;
MEXICO: C. H. Elstner, Apartado 284, Monterrey, N. L.
BUENOS AIRES, ARGENTINA: H. A. W. Myrin, San Martin 66
TRINIDAD B. W. I.: Massy, Ltd., Port au Spain
CARACAS, VENEZUELA: Parrish, Ellis & Cia. Sucrs., Apartado No. 576
LA CEIBA, HONDURAS: F. Hegenbarth, Apartado 15

SOUTHWEST TEXAS PROVEN AREAS

(Continued from Page 38)

Humble Oil & Ref. Co.'s No. 3-C Denman, 600 ft. NE of No. 2-C Denman and 700 ft. from W line of lease..Location.

SLICK POOL—DEWITT-GOLIAD COUNTIES

Simms et al's No. 1 J. C. Tom .....T.D. 2,650 ft.; drlg.

RANDADO POOL—JIM HOGG COUNTY

O. W. Killam's No. 1 Hinnant, 150 ft. N of NE cor. of Sur. No. 84 in Sur. No. 614 .....T.D. 1,300 ft.; drlg.

CHITTIM POOL—MAVERICK COUNTY

Texas Gas Utilities' No. 8 Chittim, 24 ft. S of No. 7 Chittim .....T.D. 4,850 ft.; standing.

SAXET FIELD—NUECES COUNTY

Gulf Coast Oil Co.'s No. 1 Sagarin .....T.D. 3,100 ft.; standing.
Gulf Coast Oil Co.'s No. 1 Elder, NW of same company's No. 1 Harrell .....T.D. 5,070 ft.; standing.
Gulf Coast Oil Co.'s No. 2 Sedwick, east offset to company's No. 1 Harrell .....T.D. 4,556 ft.; setting csg.
Gulf Coast Oil Co.'s No. 3 Sedwick, east offset to Houston Oil Co.'s No. 1-B Maggie Harrell .....Making location.
Houston Oil Co.'s No. 1 McGregor, 150 ft. from E line, 330 ft. from S line of 100-ac. tract in Sur. 311 .....T.D. 2,640 ft.; drlg.
Neal, Milton & Kepley's No. 2 Roark .....Making location.
Saxet Oil Co.'s No. 3 Donigan, north offset to Zoch's No. 1 Baldwin .....Location.
Saxet Oil Co.'s No. 5 Weil, 3,041 ft. to N line, 333 ft. to W line .....T.D. 2,500 ft.
Saxet Oil Co.'s No. 6 Dunn, 600 ft. S of No. 5 Dunn, 4 miles W from Corpus Christi .....T.D. 5,082 ft.; coring.

ARANSAS POOL—SAN PATRICIO COUNTY

Atlantic Oil Prod. Co., to deepen to 6,000 ft. the Welder Oil Corp.'s No. 3 Welder .....T.D. 3,689 ft.; to deepen.

LOS OLMOS POOL—STARR COUNTY

Jones & Watt's No. 1 Kelsey-Bass, 200 ft. to N and W lines of Sur. 7, Porcions 75, 76 and 77 .....T.D. 150 ft.; drlg.
Los Olmos Oil & Gas Co.'s No. 9 Kelsey-Bass, 450 ft. from W line, 150 ft. from N line of SE of SW Sec. 6, Subd. of Porcions 75, 76 and 77, Jurisdiction of Camargo .....T.D. 435 ft.; drlg.
Los Olmos Oil & Gas Co.'s No. 9 Kelsey-Bass, 450 ft. from W line, 150 ft. from N line of SE SW of Sur. No. 6 .....T.D. 502 ft.; set csg.
Quien Sabe Oil & Gas Co.'s No. 2 Kusch, 150 ft. from N line, 525 ft. from E line of Tract 11 in Porcion 75..Rigging up.
Rio Oil & Gas Co.'s No. 1 Kelsey-Bass (formerly carried as Los Olmos Oil & Ref. Co.'s No. 1 Kelsey-Bass) .....T.D. 910 ft.; standing.
Rio Oil & Gas Co.'s No. 3 Kelsey-Bass, No. 6 Subd., Porcions 75, 76, 77 .....T.D. 300 ft.; drlg.
San Marcos Oil & Gas Co.'s No. 6 Ivey, 150 ft. from E and N lines of Share 8, Subd. of Porcions 75, 76 and 77, Jurisdiction of Camargo .....Location.
E. W. Sullivan's No. 1 Kelsey-Bass, 60 ft. from N and W lines of SE SE SE of Sur. 7 .....T.D. 60 ft.; spudded in.

WEST COLE POOL—WEBB COUNTY

Magnolia Pet. Co.'s No. 6 Benavides, 1,630 ft. to N line, 150 ft. to E line of Sur. No. 660 .....T.D. 2,345 ft.; comp. 90 bbls.
French Oil Corp.'s No. 5 Benavides, 1,602 ft. from N line, 150 ft. from W line of Sur. 659 .....T.D. 2,335 ft.; oil standing in hole.

ESCOBAS POOL—ZAPATA COUNTY

E. R. Black & Paul S. Williams' No. 1 Comitas grant....Making location.
F. M. Blair & Son's No. 1 Montemayor, 450 ft. to N, 150 ft. to E line of Blk. No. 1, Sur. No. 63 .....Rigging.
Brogan & Belcher's No. 1, M. Garza, 150 ft. to NE and SE lines, Blk. 62, C. A. Douglas Subd. of Zorro ranch, Comitas grant .....T.D. 1,680 ft.; cored sand.
F. H. Etheridge's No. 5 Bustamente, 1,540 ft. from NE line, 150 ft. from NW line of Sun 80-ac. lease, Share 35, Fansler's Partition, Comitas grant .....Location.
O. W. Killam's No. 4 Medina, 500 ft. to NE, 150 ft. to NW lines of Share 34, Fansler Subd. of Comitas grant .....Location.
O. W. Killam's No. 5 Medina, 850 ft. from NE, 150 ft. from NW lines of Share 34, Fansler's Subd. of Comitas grant .....Location.
D. M. Shaffer's No. 1 M. Garza, 150 ft. from NE and NW lines of Blk. 56, C. A. Douglas Subd. of Zorro ranch .....Rigging up.
S.R.C. Oil Co.'s No. 7-D Montemayor, 150 ft. from N and E lines of Blk. 9, Sur. 64 .....T.D. 1,468 ft.; comp. 300 bbls.
S.R.C. Oil Co.'s No. 6-D Montemayor, 150 ft. from N and W lines of Blk. 10, Sur. 64 .....T.D. 1,482 ft.; plugged.
Trevino Oil Corp.'s No. 1 M. Garza Estate, 150 ft. from NE line, 350 ft. from SE lines of Blk. 36, Douglas Subd., Comitas grant .....Rigging up.
Winch & Billings' No. 9 Bustamente, 1,218 ft. from NE line, 150 ft. from SE line of 31-ac. Pal-Mar tract in Share 35, Fansler's Subd., Comitas grant.....T.D. 1,474 ft.; set csg; W.O.C., number changed.
Winch & Billings' No. 10 Jose Benavides, 500 ft. from NE and 170 ft. from SE line of 31-ac. Pal-Mar tract, Share 35, Fansler Partition of Comitas grant...Location; (number changed).

CHARCO-REDONDO POOL—ZAPATA COUNTY

Bob & Richey's No. 28 Martinez, 990 ft. from SW line, 615 ft. from SE line, Blk. 24, Duke Subd., Charco Redondo grant .....Location.
Bob & Richey's No. 29 Martinez, 810 ft. from SW line, 360 ft. from SE line of Blk. 24, W. R. Duke Subd., Charco Rendondo grant .....Location.

MARTINEZ POOL—ZAPATA COUNTY

F. H. Etheridge's No. 2 Winch & Henne, 1,100 ft. to W line, 520 ft. to S line, Sur. No. 286 .....T.D. 1,745 ft.; temp. abnd.
F. H. Etheridge's No. 3 Winch & Henne, 160 ft. from W line, 200 ft. from S line of Blk. 10, Sur. 286.....Spudded in.
K. & M. Oil Co.'s No. 1 Trevino, 150 ft. from N and W lines of Blk. 7, Sur. 13 .....Moving in.

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

(Continued from Page 38)

J. E. Anderson's No. 1 Suburban Irrigated Farms, 500 ft. to N line, 600 ft. to E line of C. Logan Sur.....T.D. 1,773 ft.; S.D.
Eckert et al's No. 1 Edwards, 150 ft. to N and W lines of farm in Martinez Sur. .....T.D. 1,490 ft.; standing.
Callahan Final Oil Co.'s No. 1 B. H. Buck, 900 ft. to E line, 3,200 ft. to S line of farm, in J. M. McGamley Sur. .....T.D. 650 ft.; drlg.
Dr. Ewell Neil's No. 1 J. Watson, 500 ft. from W line, 1,700 ft. from S line of B. Martinez Sur. .....T.D. 2,328 ft.; bailing sulphur wtr.
Jones & Voltz' No. 6 Bonkowsky .....T.D. 650 ft.; drlg.
O. K. Oil Co.'s No. 1 Strum, 150 ft. S of N line, 150 ft. W of E line, John Grant Sur. .....Drlg.
O. K. Oil Co.'s No. 2 Strum, 150 ft. from S line, 1,051 ft. W of E line, Juan Mantes Sur. .....Drlg.
Schneider, Rees et al's No. 2 Clausen, 12 miles NE of San Antonio .....T.D. 1,150 ft.; S.D.
W. R. Swearingen et al's No. 7 Halberdier, 150 ft. W of E line, 540 ft. S of N line, J. M. Peres Sur.....T.D. 800 ft.; drlg.
S. W. Blount's No. 1 S. A. Land Co., I. Perez Sur., 1,000 ft. to N line, 450 ft. to W line of tract .....T.D. 520 ft.; S.D.
Van Duyn et al's No. 1 Bradden, 5,000 ft. N of Medina River, 350 ft. to E line of tract, 8 miles W of San Antonio .....T.D. 825 ft.; abnd.

CALDWELL COUNTY

Cole & Moseley's No. 1 Pierce, 150 ft. to NW and SW lines of tract, Solomon Seal Sur. .....T.D. 825 ft.; S.D. for repairs.
Kistler, Stivers & Hendrick's No. 1 D. Carter, 400 ft. from NW line of Sur., 300 ft. NE of Creek in I. Allen Sur. .....Rigging up.
Meyer's No. 1 G. C. and W. Walker, Solomon Seal Sur....T.D. 160 ft.; drlg.
M. O. Rayor's No. 3 N. L. Dunlop, 350 ft. to NW line, 150 ft. to NE line of farm, Solomon Seal Sur. .....T.D. 2,503 ft.; plugged back to Buda.

DUVAL COUNTY

Frank Gravis et al's No. 2 Schallert, 425 ft. to E line, 150 ft. to S line of Blk. 10, Cain & Smith Subd. "A", Sur. No. 255 .....T.D. 1,430 ft.; no report.
O. W. Killam's No. 1 Sutherland, Sur. No. 7, 3,200 ft. to E line, 150 ft. to N line .....T.D. 2,805 ft.; drlg.
O. W. Killam's No. 1 Peters, 150 ft. from E line, 450 ft. from N line of SE of Sur. No. 1 .....T.D. 1,035 ft.; drlg.
R. A. Thompson's No. 1 Parr, 2,640 ft. to W line, 12,160 ft. to S line of San Andres grant .....T.D. 2,910 ft.; drlg.
Vacuum Oil Co.'s No. 1 Duval Land Co., 260 ft. from S and E lines of Sur. 96 .....T.D. 2,350 ft.; drlg.

GUADALUPE COUNTY

Barnhill et al's No. 1 H. L. Hoffman, 450 ft. to N and W lines of farm, in John G. King Sur. .....T.D. 850 ft.; S.D.

GOLIAD COUNTY

Hoffman & Gooch's No. 1 Fromme, taken over from Rheimenschneider to be deepened .....T.D. 2,279 ft.; derrick up.
Hoffman & Gooch's No. 1 Fromme, 600 ft. from N and 1,200 ft. from W line of Peter B. Dexter Sur. .....T.D. 2,279 ft.; rig up to deepen.
Plymouth Oil Co.'s No. 1 Parks, 5 miles NE Goliad .....T.D. 4,625 ft.; waiting on orders.
Neal et al's No. 1 J. M. Pettus, 10,700 ft. to S line, 2,500 ft. to E line of Pedro Trevino Sur. .....T.D. 4,175 ft.; drilling deeper.

GONALES COUNTY

Crowder Oil Co.'s No. 1 Preston, 1,000 ft. from W line, 2,000 ft. from N line of W. W. Pace Sur. .....Spudded in and S.D.
Johnson & Mattock's No. 1 J. James, 12 miles NE of Gonzales city, 900 varas from E line, 300 ft. from S line of tract in M. A. Williams Sur. .....T.D. 200 ft.; drlg.

HIDALGO COUNTY

Barrett-Kanelios' No. 1 J. B. Brock, 7 miles W and N from Mission (on Monte Cristo road) .....T.D. 2,715 ft.; drlg.
LaJoya Oil & Gas Co.'s No. 1 W. L. Hart, 6 miles W from Mission, north of San Fordyce .....T.D. 4,239 ft.; drlg.
Dayle L. Smith's No. 1, 18 miles W from Edinburg ....T.D. 4,026 ft.; standing, showing gas.
San Roman Oil Co.'s No. 1 J. T. Lomax, 7,500 ft. from S and E lines of San Roman Sur. .....T.D. 486 ft.; set csg., W.O.C.
Dayle L. Smith's No. 3 Daskam, SW part of county.....T.D. 210 ft.; drlg.

JIM HOGG COUNTY

L. W. Connor's No. 1 Holbien, 150 ft. from N and E lines of Blk. 7, Sur. 7, Holbien Subd. of Las Animas grant .....T.D. 1,115 ft.; drlg.
O. W. Killam's No. 1 Hinnant, 150 ft. N of NE cor. of Sur. 84 and in Sur. 614 .....T.D. 2,245 ft.; abnd.
T. P. Morgan's No. 1 fee, 2,223 ft. to N line, 1,640 ft. to E line of Share 19, Palo Blanco grant .....T.D. 1,500 ft.; S.D. for water.

JIM WELLS COUNTY

Gulf Prod. Co.'s No. 5 Shaeffer, SE cor. of Sur. No. 89..T.D. 2,700 ft.; drlg.
Vacuum Oil Co.'s No. 1 Seeligson, 4,500 ft. to W line, 75,000 ft. to S line of Los Jaboncillos Sur. .....T.D. 3,505 ft.; drlg.

KARNES COUNTY

A. E. Edmiston's No. 1 O. L. Cochran, 150 ft. from S line, 500 ft. from E line of farm in D. B. McConnell Sur. .....T.D. 1,800 ft.; standing.

KENDALL COUNTY

Dixon Oil Co.'s No. 1 Ottmar Behr, 823 ft. from S and N lines of Jessie Wilson Sur., 3 miles S of Sisterdale .....T.D. 2,708 ft.; standing.
Fred S. Dibble's No. 1 Ellebrach, Sur. 77, N part of county .....T.D. 50 ft.; S.D.

KERR COUNTY

George Ball's No. 1 F. A. Karger, 3 miles north of Kerville .....Rig on ground.
Evans & Gant's No. 1 E. Young, A. E. Burge Sur. No. 28..T.D. 1,312 ft.; standing.
Evans & Gant's No. 2 Love, 150 ft. S and W line of Sur. 1,593 .....T.D. 5,849 ft.; underreaming csg.
Verde Oil & Gas Co.'s No. 1 J. D. Witt, 1,320 ft. from N line, 1,220 ft. from W line of Sec. 1,923, Hamilton Sur., 4 miles S from Center Point. T.D. 200 ft. Carried to this depth and abandoned as Herber Oil Co.'s No. 1 J. D. Witt .....T.D. 200 ft.; rigging up to deepen.

LIVE OAK COUNTY

Coastal Oil Finding Co.'s No. 1 Handley, 1,200 ft. from SE line, 400 ft. from SW line of tract in C. S. Cobb Sur. .....Rigging up.
J. A. Harper's No. 1 fee, 2,130 ft. to N line, 510 ft. to E line of farm, J. Pointevant Sur. No. 37 .....Spudded in and standing.
Henderson Coquat's No. 1 Hewitt, 250 ft. from N and E lines of SW of Sec. 5, Thomas Adams Sur. .....T.D. 1,785 ft.; S.D.
Henderson Coquat's No. 2 Sanger, 1,280 ft. NW of No. 1 Sanger .....Rigging up.

LEE COUNTY

Henderson & Holden's No. 1 Dismuke, 600 ft. to E line, 150 ft. to N line of farm, J. Maxmillan Sur. .....Rigging up.
A. H. Wheeler and associates' No. 1 fee, Blk. 47, H. Donohue Sur. .....T.D. 3,890 ft.; S.D.
C. B. Polk et al's No. 1 Stoltz, Hiram Donohue Sur. ....T.D. 2,300 ft.; S.D.
Chadwick et al's No. 1 Hickey, 1,000 ft. to NW line, 300 ft. to NE line of farm in Varreiman Sur. .....T.D. 20 ft.; spudded in.
Washington-Lee Oil Co.'s No. 1 L. Hicket, 1,100 ft. from N line, 200 ft. from E line of tract in J. D. Varreiman Sur. .....Location.

McMULLEN COUNTY

Jacob, Buzzini & Pickett's No. 1 Brewer, 750 ft. NE of Pickett's No. 1 Nelson .....T.D. 1,309 ft.; abnd.
V. G. Shimmel's No. 2 Hale, 300 ft. S of No. 1 Hale....Rigging up.

MAVERICK COUNTY

I. N. Boicourt's No. 1 Bandera, School Land .....T.D. 2,284 ft.; standing

MEDINA COUNTY

Frank A. Brown's No. 1 Fohn, 150 ft. from E line, 790 ft. from N line of J. F. Torry Sur. No. 113 .....T.D. 922 ft.; twisted off drill stem, fishing.
C. J. Webster Oil & Gas Co.'s No. 1 Adams, 2,450 ft. to N line, 160 ft. to E line of Jos. Hillemeyer's No. 25. T.D. 2,736 ft.; drlg.

MILAM COUNTY

H. W. Elliott's No. 1 Marek, 767 ft. from N line, 500 ft. from W line of 160-ac. tract in B. Wickson Sur.....T.D. 3,000 ft.; S.D.
Red Bank Oil Co.'s No. 2-A J. A. Foster, 5,243 ft. to SW line, 150 ft. to NW line of farm .....T.D. 5,055 ft.; drlg.
Frank A. Yeager's No. 1 Hose, 750 ft. from E line, 150 ft. from S line of lease in E. Allen Sur. .....T.D. 1,376 ft.; set csg.

NUECES COUNTY

Camp and Stanolind Oil & Gas Co.'s No. 1 King, 600 ft. to N and W lines of Sec. 22, Richard King farm lots subd. .....Location.
C. E. McCarthy's No. 1, W of Corpus Christi .....Making location.

REAL COUNTY

McGinley Corp.'s No. 1 Haby, C of SW, Sec. 175 .....T.D. 2,530 ft.; resuming drilling.

SAN PATRICIO COUNTY

John F. Camp's No. 1 Jackson, SW cor. of SW Sec. 30, 3 miles N from Edroy .....Rigged up.

STARR COUNTY

Davenport et al's No. 1 Wells, 30 miles W of Mission ... .T.D. 1,093 ft.; drlg.
R. E. Johnson's No. 1 Goodrich, 1,214 ft. from N line, 1,065 ft. from W line of tract, 1½ miles N of Rio Grande City .....T.D. 1,200 ft.; drlg.
Strauch Oil Corp.'s No. 1 M. E. Salinas, 155 ft. from N and W lines of lease in Porcion 80, Share 38 .....T.D. 860 ft.; drlg.

R. B. Suttle's No. 1 Guerra, 2,000 ft. to N line, 270 ft. to W line of Porcion 110 ..... T.D. 810 ft.; no report.
Jess Williams' No. 1 Welsh, 1,120 ft. to W line, 1,500 ft. to N line of tract in Pedernal grant ..... T.D. 490 ft.; drlg.

TRAVIS COUNTY

C. R. Franklin et al's No. 1 J. Wilson, 160 ft. from N and W lines of farm in A. Alexander Sur. ..... T.D. 1,180 ft.; S.D.
Fuchs et al's No. 1 Shiffler, 1,000 ft. to N line, 160 ft. to E line of farm, A. C. Caldwell Sur. ..... T.D. 515 ft.; standing.
Ray & Henze's No. 1 Hatech, in C of tract in S. Hamilton Sur. ..... T.D. 540 ft.; S.D.

WEBB COUNTY

O. W. Killam's No. 4 Bruni, 5,050 ft. to NE line, 7,675 ft. to SE line of El Ranchito tract, J. V. Borrego grant ..... Derrick.
Power & Dettenhalm's No. 1 Cowan & Goss, 1,370 ft. from W line, 1,656 ft. from N line of Sur. No. 1,606 .. T.D. 405 ft.; standing.
Fansler, Johnson & Peacock's No. 1 Laurel, 425 ft. to N line, 600 ft. to E line of Blk. 10, Sur. 271 ..... T.D. 1,480 ft.; drlg.
W. R. Shankle's No. 1 Ellison Furniture & Carpet Co., 150 ft. from SW and NW lines of Blk. 2, Sur. 466 ... Derrick.

WILLIAMSON COUNTY

Burns et al's No. 1 Wilder, 1,800 ft. to N line, 200 ft. to W line of tract in H. Owens Sur. ..... T.D. 1,480 ft.; no report.
Hays & Gee's No. 1 E. G. Johnson, 1,800 ft. from N line, 170 ft. from E line of tract in B. C. Low Sur., S of Georgetown ..... T.D. 1,595 ft.; S.D.
McLean et al's No. 2 R. C. Miller, 800 ft. to S line, 100 ft. to W line of tract in B. Manlove Sur. ..... Rigging up.
G. B. Peterman's No. 1 Galler, 1,800 ft. from S line, 150 ft. from W line of 140-ac. tract in H.Y.&B.R.R. Sur. ..... T.D. 1,100 ft.; drlg.
R. S. Wilson's No. 1 Speckles, 150 ft. N of road, 600 ft. from W line of farm in J. Jordan Sur., 1 mile N of Coupland ..... T.D. 875 ft.; S.D.

WILSON COUNTY

A. M. Blume's No. 1 Nickolson, C. Diaz Sur. ..... T.D. 1,600 ft.; S.D.

ZAPATA COUNTY

Ballard & Mercer's No. 1 Flores, 500 ft. from NE line, 580 ft. from SE line of Blk. 27, Porcion 37 ..... T.D. 1,640 ft.; standing.
George Ball's No. 1 Gutierrez in Charco Redondo grant, taken over from Moore et al to deepen ..... T.D. 2,065 ft.; drlg.

ZAVALLA COUNTY

Carpenter & Jenkins et al's No. 1 John Wolf, Sec. 8, Abstract 1,199 ..... T.D. 767 ft.; setting csg. to test show of gas.

LOUISIANA-ARKANSAS PROVEN AREAS

(Continued from Page 37)

Ray Baker's No. 1 Sabine Lbr. Co., Sec. 1-7-12 ..... Abd. 2,548 ft.
Coates Pet. Co.'s No. 2 McNeely, Sec. 14-7-11, 250 ft. S and W, NE cor. NW NE ..... Derrick.
Crescent Drlg. Co.'s No. 3 Byrd, 330 ft. S and W NE NW, Sec. 12-7-11 ..... Rigging up.
Crescent Drlg. Co.'s No. 2 Byrd, Sec. 12-7-11, 330 ft. S and W, NE cor. NW NE ..... W.O.S.R. 2,505 ft.
Crescent Drlg. Co.'s No. 1 Cook, Sec. 12-7-11, 330 ft. S and W, NE cor. NE NW ..... Location.
O. A. Gautier et al's No. 1 Mischell, 330 ft. E, 150 ft. N, SW cor. SE NW, Sec. 30-8-12 ..... Dry and abd. 2,599 ft.
Hawkins & Antoon's No. 1 Newton, Sec. 1-7-11 ..... W.O.S.R. 2,609 ft.
Hudson & Bird's No. 1 Walden, 480 ft. N, 300 ft. E, SW cor. SW NE, Sec. 26-8-11 ..... S.D. 2,454 ft.
W. F. Lacey's No. 2 McNeely, 550 ft. E, 330 ft. N, SW cor. NE NE, Sec. 14-7-11 ..... Set 10-in. 101 ft; set 6-in. 2,451 ft.
Zeke Lohman's No. 1 McCormick, 660 ft. E, 330 ft. N, SW cor. NE SW, Sec. 2-7-11 ..... Fishing for D.S. 1,650 ft.
Loring Oil Co.'s No. 18 Bowman-Hicks, 1,280 ft. S, 275 ft. E, NW cor. SW NW, Sec. 15-7-12 ..... Drlg. 4,475 ft.
Ben Merritt, tr.'s No. 2 Byrd, Sec. 1-7-11 ..... S.D.; W.O. 2,579 ft.
Ohio Oil Co.'s No. 14 Bowman-Hicks, Sec. 3-7-12, 330 ft. S and W, NE cor. NW SW ..... Set 6⅝-in. 2,326 ft.
Eddie Self's No. 3 Jacoba, Sec. 1-7-11, 150 ft. N and E, SW cor. SE SE ..... Completed for 75 bbls. 2,518 ft.
Stovall Drlg. Co.'s No. 3 Nulton, 330 ft. N and W, SE cor. SE NE, Sec. 2-7-13 ..... Location.

ARKANSAS
UNION COUNTY—EL DORADO

Ark. O. & G. Co.'s No. 4 Anderson, Sec. 31-17-15, 2,005 ft. S, 150 ft. W, NE cor. NW SW ..... Testing 2,190 ft.
Lion O. & R. Co.'s No. 9-A G. P. Hayes, 242 ft. S, 246 ft. W, NE cor. Lot 5, NE, Sec. 4-16-15 ..... Lubricating stuck D.S. 7,255 ft.
Southern Prod. Co.'s No. 1 Wingfield, NE cor. SE NW, Sec. 16-19-15 ..... S.D. 2,608 ft.

UNION COUNTY—URBANA

Marine Oil Co.'s No. 1 Winn est., 330 ft. S and E, NE cor. S½ NW, Sec. 11-18-13 ..... T.A. 3,586 ft.
Marine Oil Co.'s No. 2-E Thompson, 330 ft. N, 330 ft. E, SW cor. NE NE, Sec. 10-18-13 ..... Location.
Wilson & Chapman's No. 1-B Hadley, Sec. 3-18-13, 330 ft. S and W, NE cor. SE NW ..... T.A. 3,545 ft.

EAST TEXAS
PANOLA COUNTY

Daisy O. & G. Co.'s No. 1 Rucks, John Palmer Sur. ..... S.D. 3,194 ft.
Nat. Gas Prod. Co.'s No. 3 Mays, 158 ft. S, 443 ft. W, NE cor. 42.5-ac. tr., Jane Thorpe Sur. ..... S.D. 3,038 ft; high wtr.
United Prod. Co.'s No. 12 Werner, 1,959 ft. W, 556 ft. N, SE cor. 66.6-ac. tr., B. C. Jordan Sur. ..... Derrick.
United Prod. Corp.'s No. 17 Steele, 1,320 ft. N, 660 ft. W, SE cor. C. D. Steele lse., in B. C. Jordan Sur. ... Location.

MISSISSIPPI
HINDS COUNTY

James Alexander, tr.'s No. 1 Fuller, Sec. 26-6n-1e, C NW NE ..... Location.
Ferguson-Fuller et al's No. 1 Cruse, Sec. 34-6n-1e, 420 ft. E, 170 ft. N, SW cor. NW ..... Rigging up.
Love Pet. Co.'s No. 1 Interior Lbr. Co., Sec. 2-5n-1e, 90 ft. W, 270 ft. N, SE cor. SW ..... Rigging up.

RANKIN COUNTY

Cummins & Montgomery's No. 1 Ivey, Sec. 13-5n-1e, NE Lot 10, Blk. D, E. Jackson Pl., First Addn. ... Derrick.
Meredith et al's No. 1 Strowder, Sec. 12-5n-1e, SE cor. SW NE ..... Set 10-in. 45 ft.

WILDCAT OPERATIONS IN MISSISSIPPI

HINDS COUNTY

Company, farm and location—	Remarks:
Atkins et al's No. 1 Crane Lawrence, Sec. 23-6n-1e, 300 ft. E, 132 ft. N, SW cor. NE SE	Derrick.
Miss.-Minn. Oil Co.'s No. 1 Edwards Land Co., Sec. 23-6n-4w, 1,200 ft. N and E from center of Sec.	Rig on location.
Southern Pet. Co.'s No. 1 Wilton (was Tri-State O. & G. Co.'s), 320 ft. E, 240 ft. N, SW cor. SE NE, Sec. 28-6-1e	Waiting orders 2,498 ft.

JASPER COUNTY

Bay Springs Pet. Co.'s No. 1 Keyes, C NW NE, Sec. 2-12-9 ..... S.D. for D.S. 3,171 ft.

LOWNDES COUNTY

Lowndes County Oil & Dev. Co.'s No. 1 Carr est., Sec. 34-17-16e, 1,320 ft. E, 330 ft. S, NW cor. Sec. ..... Rig on location.

NEWTON COUNTY

Bob Dalton's No. 1 Majure, 400 ft. N, 300 ft. E, SW cor. SE, Sec. 25-6n-11e ..... S.D. 840 ft.

NOXUBEE COUNTY

Thompson & Donohoue's No. 1 Donohue, Sec. 25-16n-17e. S.D. 1,735 ft.

RANKIN COUNTY

Attkisson & Dyer's No. 1 Valentour, 200 ft. S, 200 ft. E, NW cor., Sec. 18-5n-2e ..... Waiting on csg. 2,428 ft.
James Alexander, tr's No. 1 Taylor & Watkins, Sec. 1-5n-1e, 175 ft. N, 75 ft. W, SE cor. ..... Set 6⅝-in. 2,343 ft.
Henslee et al's No. 1 Tanner, Sec. 14-5n-1e, 400 ft. S, 200 ft. E, NW cor. NE NE ..... Set 10-in. 100 ft; drlg. 1,230 ft.
Majestic O. & G. Co.'s No. 1 Elton Lbr. Co., Sec. 10-4n-3e. Derrick.
Muse & Muse's No. 1 Cotton, Sec. 14-5n-1e, 1,320 ft. S, 200 ft. E, NW cor. NE NW ..... Set 10-in. 81 ft; drlg. 1,280 ft.

SCOTT COUNTY

M. U. Culley et al's No. 1 Owens, Sec. 2-8-9 ..... Derrick.

SHARKEY COUNTY

United Gas Public Service Co.'s No. 1 Lenhart, Sec. 14-14n-6w, 660 ft. N of C of S line of Sec. ..... Drlg. 165 ft.

WARREN COUNTY

Eagle Bend O. & G. Co.'s No. 1 Kiger, SW cor. SW SE, Sec. 9-18-2 ..... S.D. 2,607 ft.

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Continued from Page 37)

A. R. Smith's No. 1 Horn, Sec. 16-12-16, NE cor. Sec. ... Rigging up.
A. A. Tutin's No. 1 Mickie, Sec. 7-13-12 ..... Location.
Valters-Nicholson, tr.'s No. 1 Jim Guy, Sec. 3-11-13 ..... S.D. 1,266 ft.

MOREHOUSE PARISH

United Gas Public Service Co.'s No. 2 Sandidge, Sec. 11-20n-4e, 656 ft. S, 1,332 ft. W, NE cor. NW ..... S.D.; high wtr.; 2,132 ft.

NATCHITOCHES PARISH

Dr. H. S. Gerson's No. 1 Smith, Sec. 11-10-8, 2,000 ft. N, NE cor. of irregular Sec. 10, in Sec. 11 ..... S.D. 585 ft.
Dr. H. S. Gerson's No. 2 Smith, Sec. 11-10-8, 200 ft. N and 300 ft. W of NE cor. ..... Location.
Cooper et al's No. 2-A Cooper, C SE SE, Sec. 32-11-10 .. S.D. 1,518 ft.
R. A. Keaton's No. 1 Stephens, Sec. 25-10-6, 320 ft. N and W, SE cor. NW NW ..... S.D. 178 ft.
C. M. Talley et al's No. 1 C. M. Talley, 1,980 ft. W, 660 ft. S, NE cor. SE, Sec. 29-11-10 ..... S.D. 1,380 ft.

OUACHITA PARISH

J. J. Potts, agent's No. 1 Robinson-Reed, Sec. 11-18-4e, 1,745 ft. N, 780 ft. E, SW cor. Sec. ..... Rigged up and S.D.; high wtr.
Wilson & Mitchell's No. 1 Williams, Sec. 5-16-1e, 330 ft. E, 240 ft. S, NW cor. SW SE ..... Drlg. 2,050 ft.

RED RIVER PARISH

La. Oil Dev. Co.'s No. 2 La. Delta Pecan Co., 2,950 ft. S, 300 ft. E, NW cor., Sec. 27-13-11 ..... Spudded and S.D. 50 ft.

RICHLAND PARISH

National Gas Co.'s No. 1 Singletary, 1,980 ft. N, 660 ft. W, SE cor., Sec. 20-18n-7e ..... S.D. 2,515 ft.

SABINE PARISH

Baird & Hunter's No. 1 Petty, Sec. 11-7-11 ..... Derrick.
Baird & Stone's No. 1 McNeely, Sec. 14-7-11 ..... Set. 10-in. 100 ft; drlg. 550 ft.
Beene et al's No. 1 Esernack, Sec. 2-7-13, 1,070 ft. S, 250 ft. W, NE cor. ..... Fishing D.S. 1,250 ft.
Coates Pet. Co.'s No. 1-B S. S. Martinez, Sec. 3-7-13, 330 ft. S and W, NE cor. SE NE ..... Location.
W. M. Coates' No. 1 Stille, 330 ft. N, 660 ft. W, SE cor., Sec. 35-8-13 ..... Derrick.
W. M. Coates et al's No. 1 Mansfield Hardwood Lbr. Co., Sec. 36-8-13, SW cor. SE SE ..... Testing 2,125 ft.
B. A. Ferrell's No. 1 Haley, Sec. 6-7-12, 300 ft. S and E, NW cor. NW SW ..... Location.
Frank Foster, Inc.'s No. 1 Stephens, Sec. 20-9-11, 330 ft. S and W, NE cor. NW NW ..... Drlg. 50 ft.
R. L. Gay, tr.'s No. 1-A Long Bell Lbr. Co., 430 ft. S, 200 ft. W, NE cor. NW NW, Sec. 10-8-13 ..... Drlg. 4,745 ft.
T. M. LeGrand's No. 1 Peterson, 330 ft. N and E of C, Sec. 34-7-13 ..... S.D. 2,243 ft.
Geo. LeGrand's No. 1 McGough, Sec. 3-8-10 ..... Derrick.
J. J. Keen, tr.'s No. 1 Belton (no check), Sec. 31-9-13 .. S.D. high wtr. 2,700 ft.
E. F. Neely's No. 1 Cobb & Alford, Sec. 14-7-11, 200 ft. S, 100 ft. E, NW cor. NE SW ..... Testing 2,590 ft.
Pelican Nat. Gas Co.'s No. 1 Buckley, Sec. 6-7-10, 330 ft. N and E, SW cor. Sec. ..... Dry and abd. 2,800 ft.
H. W. Perritt's No. 1 Brown Lbr. Co., Sec. 6-7-10, 330 ft. N and E, SW cor. SW SE ..... Location.
Service Drlg. & Royalties Corp.'s No. 1-B Gardner, Sec. 7-7-10, 330 ft. S and E, NW cor. SW NW ..... Waiting orders 2,571 ft.
J. E. Smitherman's No. 1 Smith, Sec. 7-7-10, 330 ft. S and E, NW cor. NW SW ..... Testing 2,595 ft.
Southland Drlg. Co.'s No. 1 Frank Martinez, 330 ft. S and W, NE cor. NW, Sec. 11-7-13 ..... Set 6-in. 2,036 ft.
Southland Drlg. Co.'s No. 2 F. Martinez, Sec. 11-7-13, 330 ft. S and E, NW cor. NE NW ..... Derrick pattern.
Southland Drlg. Co.'s No. 1 Gilbert Martinez, Sec. 2-7-13, 330 ft. N and W, SE cor. SW SW ..... Derrick pattern.
Southland Drlg. Co.'s No. 1 C. E. Patterson, Sec. 2-7-13, 330 ft. N and E, SW cor. Sec. ..... Set. 10-in. 100 ft; drlg. 1,100 ft.
The Texas Co.'s No. 1-B Grauque, Sec. 10-7-13, 330 ft. S and W, NE cor. SE ..... Derrick.
A. H. Thames' No. 1 Edward est., 150 ft. NW SE cor. NE SE, Sec. 8-8-13 ..... S.D. 1,200 ft.
C. H. Tuttle et al's No. 1 Byrd, Sec. 7-7-10, 330 ft. S and E, NW cor. ..... Bailing 2,565 ft.

TENSAS PARISH

A. R. Willis et al's No. 1 Currey, 1,320 ft. S, 1,320 ft. E, NW cor., Sec. 39-11-12 ..... S.D. 3,545 ft.

ARKANSAS
COLUMBIA COUNTY

Kendall Oil Co.'s No. 1 Fullenweider, Rhea & Kitchen, Sec. 13-17-22 ..... S.D.; W.O. 814 ft.

CLAY COUNTY

S. C. Joffus' No. 1 Underwood, 510 ft. N, 350 ft. W, C, NW SE, Sec. 4-20-3 ..... S.D. 1,350 ft.

CLEVELAND COUNTY

Crum & Stillwell's No. 1 E. R. Bell, Sec. 10-10s-12 ..... Rigged up and S.D.

CLEBURNE COUNTY
(Cable tools)

Donnelly-Craver et al's No. 1 Donophan Lbr. Co., SE cor. NW, Sec. 33-11-9 ..... S.D. 3,740 ft.

DALLAS COUNTY

J. H. James, tr.'s No. 1 Fordyce Lbr. Co., 200 ft. S, 200 ft. E, NW cor. SE, Sec. 11-9-15 ..... Arranging to resume drlg. at 2,514 ft.
Zepp O. & G. Co.'s No. 3 Hillman, Sec. 20-10-13, 180 ft. N, 450 ft. E, SW cor. NW NE ..... Location.

DREW COUNTY

Co-Operative Dev. Co.'s No. 1 Ogles, Sec. 35-15-5, 330 ft. S and E, NW cor. NE NW ..... S.D. 1,890 ft.

HOT SPRINGS COUNTY

Star Oil Co.'s No. 1 Cunningham, 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16 ..... S.D. 1,300 ft.

LINCOLN COUNTY

Lawrence Cook, tr.'s No. 1 McGhee Planting Co., 420 ft. S, 200 ft. W, NE cor. NE SW, Sec. 5-8-7 ..... S.D. 2,800 ft.

LITTLE RIVER COUNTY

Roberts Oil Co.'s No. 1 H. J. Russell, 330 ft. E, 330 ft. S, NW cor., Sec. 25-12-19 ..... Location.

LOGAN COUNTY

J. H. Flowers' No. 1 J. H. White, Sec. 13-6-26 ..... S.D.; W.O. 3,570 ft.

MILLER COUNTY

W. E. Noel et al's No. 1 Dickson hrs., 1,980 ft. W, 660 ft. S, NE cor., Sec. 11-20-27 ..... S.D. 1,955 ft.
OUACHITA COUNTY
Copenhaven et al's No. 2 Berg, C SE SE, Sec. 13-15-17.. S.D. 2,011 ft.
PIKE COUNTY
E. R. Henderson's No. 1 Tilyou, 660 ft. W, 500 ft. S, NE cor. NE SE, Sec. 26-8-14 ..... T.A. 2,909 ft.
E. R. Henderson's No. 1 J. L. Lee, 400 ft. S, 350 ft. E, NW cor. SW SE, Sec. 31-8-24 ..... S.D.; W.O. 1,020 ft.
E. R. Henderson's No. 1 W. B. East, 200 ft. S, 150 ft. W, NE cor., Sec. 13-9-23 ..... Drlg. hard rock 1,812 ft.
PRAIRIE COUNTY
Powell Creek O. & G. Co.'s No. 1 Kloss, NE SW, Sec. 3-4n-6w ..... Partly rigged up and S.D.
SCOTT COUNTY
Heavener O. & G. Co.'s No. 1 Riser, Sec. 36-4-26 ..... S.D.; T.D. 1,436 ft.
Waldron O. & G. Co.'s No. 1 White, NE cor. SW NW, Sec. 17-3n-29 ..... S.D. 1,860 ft.
SEVIER COUNTY
Tristate Oil Co.'s No. 1 Grimble, Sec. 34-8-22, 8½ SW .. S.D. 950 ft.
UNION COUNTY
Drillers Oil & Dev. Co.'s No. 1 Pickering, 220 ft. N, 668 ft. E, SW cor. NW NE, Sec. 1-17-16 ..... W.O.S.R. 2,134 ft.
H. H. Helms' No. 1 C. H. Murphy, NE cor. NW NE, Sec. 21-16-14 ..... S.D. high wtr. 2,155 ft.
L. M. Hill et al's No. 1 J. W. Barnes, Sec. 21-19-16, NE cor. Sec. ..... Derrick.
Sunby et al's No. 2 Perdue, Sec. 23-16-14, 75 ft. S, 150 ft. E, NW cor. Sec. ..... W.O. 3,247 ft.
Wilson & Chapman's No. 1 King, Sec. 3-18-13, 330 ft. N and E, SW cor. NE NE ..... Derrick.
Wilson & Chapman's No. 1-A D. Norman, 330 ft. S and E, NW cor. N½ NE SE, Sec. 3-18-13 ..... Derrick.
Wilson & Chapman's No. 1 K. D. Parker, Sec. 3-18-13, 330 ft. N and E, SW cor. S½ NE SE ..... Set 10-in. 210 ft; drlg. 1,125 ft.
WASHINGTON COUNTY
(Cable tools)
C. H. Willoughby's No. 1 Jones, Sec. 34-16-30 ..... S.D. for funds 1,795 ft.
YELL COUNTY
(Cable tools)
Tegmeir & Luckett's No. 1 Falcon, Sec. 36-7-21 ..... S.D. 5,710 ft.

EAST TEXAS

BOWIE COUNTY

Logan & Elliott's No. 1 Smith, 9,600 ft. S, 2,500 ft. W, NE cor. Chas. Lewis Sur. ..... S.D. 4,505 ft.
Tarkington & Jones' No. 1 W. W. Whybark, 200 ft. S, 200 ft. W, SW cor. J. H. Dyer Sur. ..... S.D. 1,880 ft.
Lee Timberlake et al's No. 2 Tidwell, 2,510 ft. N, 655 ft. W, SE cor. T. M. Rice Sur. ..... S.D. 3,000 ft.
CASS COUNTY
J. F. Morrisey's No. 1 T. J. Wilson, 1,088 ft. S of N line, 2,376 ft. E of W line of H.R.S., J. R. McFarland Sur. ..... S.D. 3,670 ft.
Davis & Pigg's No. 1 Roy Bryan, SW cor. Roy Bryan 38-ac. tr., Albert H. Lattimer Sur. ..... S.D. 2,860 ft.
William S. King's No. 1 D. W. McDonald, Martha Ingram Sur., 658 ft. W, 1,343 ft. N, SE cor. Lot 5, McDonald 61-ac. tr. ..... Reaming to bottom 2,365 ft.
C. E. Murdock's No. 1 First National Bank, Evans Watson Sur. ..... S.D. 4,390 ft.
John C. Rogers' No. 1 I. E. Lanier, 573 ft. N, 879 ft. W, SE cor. Lanier 86 ac. in K. E. Welborn Sur. .... S.D. 2,280 ft.
Olds & King's No. 2 Anthony, John C. Byers Sur. ..... S.D. 1,750 ft.
John C. Rogers et al's No. 1 W. Q. Henderson, 3,100 ft. S, 3,100 ft. E, NW cor., Wm. Davis Sur. ..... S.D. 955 ft.
HARRISON COUNTY
Lloyd Oil Corp.'s No. 1 E. S. Timmons, 150 ft. from N line to 350 ft. from E line of 105-ac. tr., Findley Sur. ..... S.D. 4,195 ft.
Ryan Cons. Pet. Corp.'s No. 1 J. M. Fuhr, 1,300 ft. N of NW cor. T. J. Copelin Sur., 1,675 ft. SW at right angles to NW SE line of O'Neal Sur. ..... Derrick.
MARION COUNTY
Geo. Hindeman et al's No. 1 F. V. Lindsey, 2,500 ft. S, most northerly N line, 3,555 ft. E most easterly W line, Alexander Albright Sur. ..... S.D. 2,380 ft.
PANOLA COUNTY
Hoffer et al's No. 1 Cameron Lbr. Co., center 1,306-ac. tr. in W. M. A. LaGrove Sur. ..... Derrick.
Moses & Wallace's No. 1 Daniel, 600 ft. N and W lines, Mrs. Gerrell 100-ac. tr., SW cor. Isabel Hanks Sur. .. Spudded and S.D.
G. A. Davidson's No. 1 Latham, Wm. Rich Sur. ..... S.D. 2,394
J. L. Nelson et al's No. 1 J. W. Williams, 300 ft. S, 700 ft. W, NE cor. Williams' 67-ac. tr. in James Hanks Sur. ..... S.D. 3,055 ft.
RED RIVER COUNTY
D. M. Buffington's No. 1 Hossler, E. Hughhart Sur. .... S.D. 2,795 ft.
Johnson Pet. Co.'s No. 3 Randolph, Edw. Dean Sur. .... S.D. 2,280 ft.
SHELBY COUNTY
Chapperell Oil Co.'s No. 2 Holt, Matthew Moore Sur. ... S.D. 1,028 ft.
Harry Elliott's No. 1 Pickering Lbr. Co., 1,000 ft. N, 150 ft. E, SW cor. 361-ac. tr., G. H. Patterson Sur. .. Setting 6-in. 1,487 ft; T.D. 1,495 ft.
K. H. Francis' No. 1 John Mims, Mary Smith Sur. ..... S.D. 3,334 ft.
H. H. Gracey's No. 1 J. A. Morrison, 1,500 ft. N, 200 ft. E, SW cor. J. A. Morris' 109-ac. tr., Wm. English Sur. ..... S.D. 3,600 ft.
Henry Mauilding's No. 1 Frost Lbr. Co., NE cor. Frost Lbr. Co.'s 80-ac. tr., A. D. Fountain Sur. ..... S.D. 3,246 ft.
McRoby et al's No. 1 Windham, Wm. Leach Sur., on Windham 296-ac. tr. ..... S.D. high wtr. 3,393 ft.
Ridgeway et al's No. 1 Polley, Dominguez Gonzales Sur., 3,180 ft. E of SW cor., 160 ft. N at right angles of Polley 457-ac. tr. ..... Set 8-in. 822 ft.
C. H. Tautenhahn's No. 1 J. C. Bogard, 300 ft. S, 900 ft. E, NW cor. J. C. Bogard's 52-ac. tr., Thomas Baker Sur. ..... S.D. 20 ft.
Tenant et al's No. 1 J. Henry, C. Z. Walker Sur. ..... S.D. 3,457 ft.

GULF COAST FIELDS AND WILDCATS

(Continued from Page 40)

Yount Lee Oil Co.'s No. 26 Cade, N. Fitzsimmons Sur., 600 ft. S of No. 24 ..... Rig.
Yount Lee Oil Co.'s No. 27 Cade, N. Fitzsimmons Sur., 600 ft. N of No. 21 in line with Nos. 22 and 23 ..... Location.
Yount Lee Oil Co.'s No. 1 Broussard & Orme, 300 ft. E of N cor. of N. Fitzsimmons Sur., in Martin Dunman Sur. ..... Spudded.

DAMON MOUND—BRAZORIA COUNTY

Intercoastal Oil Co.'s No. 6 Wisdom (D.D.), A. Darst Sur., Blk. 51, 2,650 ft. from NE line and 1,150 ft. from NW line of 840-acre tract ..... Pulling screen to deepen 3,609 ft
The Texas Company's No. 2 Cave, 165 ft. NE and 55 ft. N, 45 deg. W from S cor. Lot B, Blk. 73, Wisdom Subd., A. Darst Sur. ..... Drlg. gumbo 1,869 ft.

ESPERSON—LIBERTY COUNTY

Cranfill-Reynolds Co.'s No. 4 Davis (D.D.), Kokernot Sur. ..... No report.

SARATOGA—HARDIN COUNTY

Rio Bravo Oil Co.'s No. 128-A "B" ..... Abnd. location.
Rio Bravo Oil Co.'s No. 127-A "B" ..... Abnd. 1,035 ft.
Rio Bravo Oil Co.'s No. 129-A "B" ..... Rig.

LOST LAKE—CHAMBERS COUNTY

Pure Oil Co.'s No. 14 Mayes, E. H. R. Wallis Sur., 650 ft. due E of No. 11 in line with No. 9 ..... Drlg. sandy shale 2,370 ft.

MARKHAM—MATAGORDA COUNTY

Deering & Newman's No. 1 Meyers (W.O.), Wm. Hadden Sur., 100 ft. E of C of W line ..... T.D. 4,788 ft.; side tracked hole to 3,690 ft.; blew out making gas and mud.
L. P. Smith et al's No. 1 Hudson, 750 ft. out of SE cor. Blk. 15, Henry Parker Sur. ..... Drlg. shale and lime 2,796 ft.
United North & South Oil Co.'s No. 1 McDonald, L.&G.N. Sur., Blk. 9, Sec. 5, 460 ft. S and 80 ft. E of NW cor. 35-acre tract ..... Drlg. gumbo 1,534 ft.

REFUGIO—REFUGIO COUNTY

E. M. Jones' No. 1-B Mitchell (D.D.), 250 ft. NW of SE line and 250 ft. SW of Mission River ..... Pulling screen to deepen 5,441 ft.
Larco Gas Co.'s No. 4 Strauch heirs, 150 ft. from N line and 150 ft. from W line, Lot 6, Blk. 2 ..... Topped sand showing oil 3,686 ft.; cem. 6⅝-in. casing; standing.

SOUTH LOUISIANA FIELDS

IOWA—CALCASIEU AND JEFF DAVIS PARISHES

Shell Petroleum Corp.'s No. 2 Heyd, 225 ft. out of NE cor. of Sec. 13-9s-7w ..... Drlg. sand and shale 3,820 ft.
Shell Petroleum Corp.'s No. 1 Fontenot, Sec. 7-9s-6w, 450 ft. due E No. 2 Heyd ..... Drlg. shale and lime 3,410 ft.

JENNINGS—ACADIA PARISH

Kathleen Oil Co.'s No. 1 Syndicate fee (W.O.), Sec. 46-9s-2w ..... T.D. 3,924 ft.; sidetracked and drlg. gumbo 3,645 ft.
Yount Lee Oil Co.'s No. 10 Housierre-Latrielle, 5,435 ft. E and 1,070 ft. N of SW cor., Sec. 47-9s-2w ..... Drlg. shale and lime 8,652 ft.

HACKBERRY—CAMERON PARISH

Calcasieu Oil Co.'s No. 23 Watkins (W.O.), 2,495 ft. W. and 132 ft. N of SE cor., Sec. 13-12s-10w ..... T.D. 2,844 ft.; set whipstock 2,571 ft.
Calcasieu Oil Co.'s No. 26 Watkins (W.O.), 1,199 ft. N and 1,843 ft. W of SE cor. of Sec. 13-12s-10w ..... Standing 3,001 ft.
Calcasieu Oil Co.'s No. 31 Watkins, 1,402 ft. W and 1,120 ft. N of SE cor. of Sec. 13-12s-10w ..... Cap rock 3,184-98 ft.; standing
The Texas Company's No. 8-B State, 1,875 ft. N and 600 ft. E of SE cor. of Sec. 13-12s-10w in Sec. 9 .... Cap rock 3,312-18 ft.; abnd.
Union Sulphur Co.'s No. 1 Gulf land (Humble lease), 284 ft. N, 30 ft. W of SE cor., Sec. 11-12s-10w ..... Drlg. sandy shale 4,780 ft.
Union Sulphur Co.'s No. 1 Gulf land (Pure Oil Co. lease), 1,420 ft. N, 400 ft. W of SE cor., Sec. 11-12s-10w ..... Drlg. gumbo 3,200 ft.
Yount Lee Oil Co.'s No. 44 State, 1,110 ft. N and 1,915 ft. W of SE cor., Sec. 13-12s-10w ..... Location.
Yount Lee Oil Co.'s No. 45 State, 1,220 ft. N and 810 ft. W of SE cor., Sec. 13-12s-10w ..... Location.

VINTON—CALCASIEU PARISH

Marrs McLean's No. 13 Gray, 464 ft. E and 460 ft. S of C of Sec. 30-10s-12w ..... Rig.

SULPHUR —CALCASIEU PARISH

Union Sulphur Co.'s No. 768 fee, 375 ft. N and 188 ft. W of SE cor. SW NW of Sec. 29-9s-10w ..... Drlg. 986 ft.
Union Sulphur Co.'s No. 769 fee, 295 ft. S, 918 ft. W of C of Sec. 29-9s-10w ..... Spudded.

PORT BARRE—ST. LANDRY PARISH

Gulf Refining Co.'s No. 1 Wilson & Cockran, Sec. 4-6s-5e, 100 ft. out of middle SW cor. 502-acre tract... Drlg. 1,525 ft.
Port Barre Oil Co.'s No. 1 Sibille, Sec. 20-6n-5e, 600 ft. S and 124 ft. E of NW cor. 30-acre tract ..... Drlg. 200 ft.

MISCELLANEOUS WILDCATS

TEXAS

AUSTIN COUNTY

C. O. Farrington et al's No. 1 Jackson, Brookshire, S. F. Austin Sur. No. 10, 750 ft. NW of Empire Gas & Fuel Co.'s No. 1 Jackson and 250 ft. S of NW line ... Derrick.
Grant & Baker's No. 1 Cheeley, W. C. White Sur., 150 ft. from NW line and 150 ft. from SW line of 26-acre tract (northeast of Raccoon Bend Field) ..... Derrick.
O'Hara Oil & Gas Co.'s No. 1 Neilous, J. C. Cummings Hacienda Sur., 650 ft. N of No. 1 Schroeder in 18-acre tract, north edge Mill Creek ..... Derrick.
Pomacal & Boletka's No. 1 Schebajas, 329 ft. N, 78 deg. E of N cor. B. Dottery Sur., near center of SW line of S. F. Austin 4 League on west fork of Mill Creek.. Set 10-in. csg. 120 ft.; standing.

BRAZORIA COUNTY

W. D. Southerland's No. 1 C. W. Chapman, 294 ft. from S line and 104 ft. from E line of Lot 2, Andrew Robinson Sur. ..... Standing 1,514 ft.
The Texas Company's No. 2 Belcher, Harvey N. Little Sur., 1,728 ft. southeasterly from N cor. of S half of Sur., along NE line and thence 123 ft. at right angles ..... Sand 5,572 ft.; drill stem test showed dry gas 1,500 lbs. pressure and small amount oil in bottom joint.
United Oil Syndicate's No. 2 Levitt, John Peske Sur., 75 ft. NW of No. 1 ..... Location.

BURLESON COUNTY

Marek & Son's No. 3 A. Marek, N. McFaddin Sur., 1,068 ft. N and 225 ft. W of SE cor. of tract ..... Standing 2,210 ft.
M. O. & T. Corp.'s No. 1 Rigers ..... Shut down 2,050 ft.

FORT BEND COUNTY

O'Hara et al's No. 1 Brown, Pilant Lake, Wm. Barrett and Abner Harris Sur., 600 ft. out of SW cor. of Brown 600-acre tract ..... Drlg. gumbo 1,020 ft.
Stone & Wyman's No. 1 Beard, H.&T.C. Sur. No. 118, 1,150 ft. from NW line and 1,892 ft. from NE line.... Drill stem stuck 975 ft.

GRIMES COUNTY

Barnett et al's No. 1 Dodd, Timothy Jones Sur., 280 ft. N Co'b & Rasmussen's No. 1 Dodd ..... Rig.
Rianjo Oil Co.'s No. 3 Cuthrell, Patrick B. O'Connor Sur., 150 ft. S. 10 degrees E of No. 2 ..... Shut down 1,150 ft.
Stanolind Oil & Gas Co.'s No. 1 Mary Sullivan, A. Yeamens Sur., 998 ft. out of SE cor. of 712-acre tract.... Rig.

HARRIS COUNTY

Givens & Daybault's No. 1 Lobit, David Middleton Sur., Blk. 19, Lobit Subd. ..... Drlg. gumbo 3,050 ft.
Louisiana Oil & Dev. Co.'s No. 1 J. W. Wilson, W. Ritchie Sur. ..... Shut down 420 ft.
Shubert & Alexander's No. 1 Herman Hale, 1,058 varas E of NW cor. R. A. Hanks Sur., thence 790 varas S and thence 70 varas W 74 deg. ..... Shut down 2,720 ft.

JASPER COUNTY

Hext Drlg. Co.'s No. 1 Flourney, B. F. Jones Sur., 900 ft. NW of Helmerich & Payne's No. 1 Flourney..... Shale 3,787 ft.; shut down.

JEFFERSON COUNTY

Brown et al's No. 1 M. O. Todd, 200 varas S and 58 varas E of NW cor. of Wm. Carr Sur. ..... Drlg. gumbo 870 ft.
John I. Pipkin and Elam's No. 1 Broussard, McGaffey Sur., 800 ft. from S line in center E and W of 205-acre tract ..... Drlg. gumbo 1,985 ft.
Texas Gulf Sulphur Co.'s No. 4 Thomas, Fannett, Wm. H. Smith Sur., 1,500 ft. S and 350 ft. W of NE cor. tract ..... Sulphur test.
C. R. Tolliver et al's No. 1 Tolliver, Duches Sur., 3,500 ft. from W line and 1,500 ft. S of Pine Island Bayou.. Drlg. sandy shale 3,410 ft.
Westbury Oil Co.'s No. 4 West, 450 ft. W and 4,210 ft. S of NE cor. of T. D. Yoakum Sur. ..... Shut down in gumbo 600 ft.

LIBERTY COUNTY

Hamm et al's No. 1 Harvard, Davis Hill ..... Gumbo 1,015 ft.; shut down.
J. T. May et al's No. 1 Dunman, J. C. Martin League .. Location.

MATAGORDA COUNTY

United North & South Oil Co.'s No. 1 Stoddard, J. C. Keller Sur., 150 ft. W and 545 ft. N of SE cor. Blk. 53, Buckeye Townsite ..... Drlg. shale 7,565 ft.

MONTGOMERY COUNTY

Herman Heep et al's No. 1 Cartwright, 2,851.6 ft. southerly along W line from NW cor. of John O. Davis Sur. and thence 450 ft. E from said line..... Cmtd. 10-in. csg. 307 ft.

Pevehouse Oil Co.'s No. 1 Sealey, Jas. Pevehouse Sur., 1,575 ft. N of N line of Horton & Woodson's 1,562-acre tract and 2,226 ft. E of W line of H.&W. 1,870-acre tract ..... Coring sandy shale 3,458 ft.

NEWTON COUNTY

R. T. Briscoe et al's No. 1-A Joe Inman, 1,950 ft. E and 500 ft. N of SW cor. J. M. Scott Sur. ..... Shut down 1,700 ft.

ORANGE COUNTY

Altex Oil Co.'s (Veteran Oil Co.) No. 1 Reed, A. Nelson Sur. No. 1, 500 ft. from N line and 250 ft. from E line of tract ..... T.D. 4,063 ft.; sidetracked to 3,390 ft.; shut down.

Crew Oil Co.'s No. 1-A Mansfield, 50 ft. E of No. 1..... Shut down 2,275 ft.

POLK COUNTY

Freeman et al's No. 2 Freeman ..... Shut down 3,162 ft.

T. B. Hoffer's No. 1 Saner-Ragly Lbr. Co., 200 ft. out of most northerly cor. of most easterly County School Land Abst. 271 ..... Shut down 1,517 ft.

REFUGIO COUNTY

Blanco Creek Oil Co.'s No. 1 Damaan, 150 ft. from N line and 150 ft. from W line of Blk. 14, Bonnie View Ranch Subd. ..... Shut down 4,627 ft.

J. C. Dixon's No. 1 Peck, 450 ft. S, 150 ft. E of NW cor. of S half of Sec. 24, Bonnie View Ranch Subd., Estaban Lopez Sur. ..... Cmtd. 12½-in. csg. 100 ft.; standing.

Humble Oil & Ref. Co.'s No. 2 O'Connor, John Keating Sur., 12,625 ft. N of S line at right angles and 8,158 ft. W of E line at right angles ..... Drlg. shale 532 ft.

SAN JACINTO COUNTY

E. P. Edwards' No. 1 J. R. Bennett, Cold Springs ..... Shut down 750 ft.

TRINITY COUNTY

John Deering's No. 1 J. B. Gibson ..... Drlg. 1,500 ft.

Mound Prairie Oil Co.'s No. 1 Cameron ..... Coring shale 2,720 ft.

Scientific Producers Co.'s No. 1 Thompson, L&G.N. Sur. No. 47, 50 ft. out of NE cor. of H. K. Thompson 193-acre tract ..... Shut down 1,191 ft.

TYLER COUNTY

King Oil Co.'s No. 1 Caswell ..... Sand and shale showing oil 1,258 ft.; cem. 6-in. casing 1,218 ft.; standing.

Allied Pet. Co.'s (Texas Southern Pet. Co.) No. 3 Wilson, Mrs. E. Cherry Sur. No. 798, 1,500 varas from W line and 600 varas from N line ..... Shut down 5,025 ft.

VICTORIA COUNTY

Bunte et al's No. 2 Keeran, Martin DeLeon Sur., 200 ft. E of No. 1 ..... Location.

T. B. Slick Estate's No. 2 McFaddin, J. Varian Sur., 3,500 ft. NW of No. 1 and 1,100 ft. NE at right angles to SW line of lease ..... Location.

The Texas Company's No. 4 McFaddin, 86 deg. E, 1,728½ ft. from NE cor. of Andrew J. Gray Sur. in John M. Rine Sur. ..... Spudded.

WALKER COUNTY

Hart Oil Co.'s No. 1 Thompson Lbr. Co., Jose Ortega Sur., 1,265 ft. S, 1,876 ft. W of SW cor. of J. B. Gibson's 71-acre tract ..... Shut down for repairs 2,090 ft.

WALLER COUNTY

McDaniel and associates' No. 1 Citizens State Bank, B.B.B.&C. Sur., C of 150-acre tract ..... No report.

SOUTH LOUISIANA

ASCENSION PARISH

McElroy Pet. Co.'s No. 2 Lacey, 150 ft. S, 150 ft. W of NE cor. of Sec. 29-10s-4e ..... Shut down 4,515 ft.

CALCASIEU PARISH

Crawford Doyle's No. 1 Johnson, Sec. 23-9s-13w..... Shut down 875 ft.

L. O. Davis' No. 1 Industrial, Sec. 29-9s-10w..... Standing 6,568 ft.

Hill Oil Co.'s No. 1 W. S. Vincent et al, 642 ft. W, 75 ft. N from SE cor., Sec. 35-10s-10w..... Drlg. 3,000 ft.

Wilfred Lahay's No. 1 Jardell, Sec. 16-10s-12w..... Shut down 3,650 ft.

Success Oil Co.'s No. 1 Hewitt, 90 ft. out of SW cor., Sec. 11-9s-11w ..... Rig.

CAMERON PARISH

Brownie-Babbette Oil Co.'s No. 1 R. A. Moore, 562 ft. W, 50 ft. S of NE cor. E half SE of Sec. 18-12s-12w.. Rigging up.

EVANGELINE PARISH

Emile LeDeau's No. 1 Vidrine, 260 ft. W and 350 ft. S of NE cor. of Sec. 47-3s-2e ..... Rig.

IBERIA PARISH

Jefferson Lake Oil Co.'s No. 27 Lake Peigneur, Sec. 58-12s-5e, midway between Nos. 24 and 25..... Sulphur test.

Jefferson Lake Oil Co.'s No. 28 Lake Peigneur, Sec. 58-12s-5e, 150 ft. W NW of No. 26 and 1,720 ft. SW No. 25 ..... Sulphur test.

IBERVILLE PARISH

Standard Oil Co.'s No. 2 Myrtle Grove-Wilbert, Bayou Choctaw, 2,040 ft. N and 600 ft. W of C of Sec. 52-9s-11e ..... Drlg. 1,135 ft.

Standard Oil Co.'s No. 2 Gay, Bayou Choctaw, 4,500 ft. N and 600 ft. E of SW cor. SE of Sec. 52-9s-11e..... Drlg. 4,500 ft.

Standard Oil Co.'s No. 7 Schwing, Bayou Blue, 1,359 ft. N and 1,856 ft. E of C of Sec. 74-9s-10w..... Drlg. 3,520 ft.

LA FOURCHE PARISH

Pop Oil Co.'s No. 1 Esponge Vizier, Sec. 26-21s-22e, 78 ft. N, 289 ft. E of The Texas Company No. 4 L.L.&E. ..... Drlg. 2,450 ft.

The Texas Company's No. 4 L.L.&E., Leesville, Sec. 26-21s-22e ..... Drlg. 205 ft.

PLAQUEMINES PARISH

Humble Oil & Ref. Co.'s No. 7 Cockrell-Moran, Sec. 14-20s-26e, 400 ft. S of No. 4 ..... Total depth in cap rock 1,174 ft.; 9⅝-in. csg. 1,163 ft.; bailed open hole and flowed 300 to 350 bbls. in first hour through 2¼-in. line; shut in for tubing and connections.

POINTE COUPEE PARISH

Grand Bay Oil & Gas Co.'s No. 1 Moniotte, 10,140 ft. S and 13,450 ft. E of NW cor. Twp. 5s-11 in Sec. 34.... Shut down 310 ft.

TERREBONNE PARISH

La. Gas & Fuel Co.'s No. 2 Minor, 3,480 ft. S and 1,980 ft. E of NW cor., Sec. 3-18s-16e ..... S.D. 4,490 ft.

The Texas Company's No. 1 Bay St. Elaine, 1,200 ft. N and 2,660 ft. W of SE cor. of Sec. 8-22s-18e ..... Bldg. derrick foundations.

The Texas Company's No. 5 State, Dog Lake, 2,270 ft. S and 450 ft. E of NW cor. of Sec. 5-22s-16e..... Bldg. derrick foundations.

The Texas Company's No. 4 La.L.&E., Bay Junop..... Location.

The Texas Company's No. 5 State, Lake Pelto, 1,505 ft. N and 1,539 ft. W of SE cor. of Sec. 8-23s-18e..... Cap rock 1,683-94 ft.; cmtd. 9⅝-in. csg. 1,685 ft.; drld. plug and set 37 ft. of 4⅝-in. screen; swabbing 1½ bbls. per hour.

The Texas Company's No. 10 State, Lake Barre..... Location.

The Texas Company's No. 12 State, Lake Barre..... Rig.

The Texas Company's No. 14 State, Lake Barre..... Location.

VERMILLION PARISH

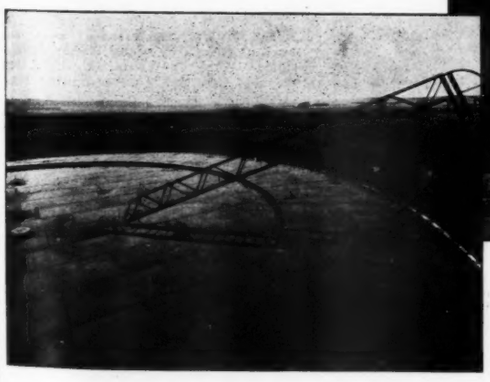
Pure Oil Co.'s No. 2 Alliance Trust Co. Gueydan, 1,875 ft. E and 950 ft. S of NW cor. of Sec. 34-11-1w.. Sand and shale 2,749 ft.; fishing core barrel.

WEST FELICIANA PARISH

Putnam Syndicate's No. 3 Como Plantation, Sec. 51-1s-4w. Shut down 2,449 ft.

CHICAGO BRIDGE & IRON WORKS

Builders of tanks, refinery equipment, Wiggins Breather Roofs and » » » »



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THE certainty of stopping evaporation with a roof which rests directly on the oil surface is quite obvious. You can, however, satisfy yourself of the big potential savings through the use of such a roof in two ways:

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2. Arrange for a test by the newly developed vapor pressure method to determine just how much volumetric loss you are sustaining from any particular tank and how much of a saving a Wiggins Pontoon Roof would represent.

Our nearest office will gladly assist you in these two check-ups. Ask for a description of the new vapor pressure test and an estimate on any roof you need.

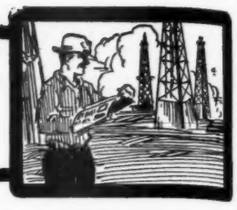
SALES OFFICES:

DALLAS	1241 Burt Bldg.
HOUSTON	1119 Electric Bldg.
TULSA	1406 Philcade Bldg.
BIRMINGHAM	1536 Fiftieth St., N.
CHICAGO	2128 Old Colony Bldg.
DETROIT	1514 Lafayette Bldg.
CLEVELAND	2204 Midland Bank Bldg.
NEW YORK	3147 Hudson Terminal Bldg.
PHILADELPHIA	2615 "1616" Walnut St. Bldg.
SAN FRANCISCO	1054 Rialto Bldg.

OGJ 2-25 Gray

CLASSIFIED WANTS

Read by Oil Men Everywhere



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THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

FOR SALE—EQUIPMENT

FOR SALE—New Braden Type B-15 heavy duty winch. Suitable for use with truck or tractor as rod and tubing machine. Address Box E-930, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE

GASOLINE PLANT

(Absorption)

Complete in every detail.

Located at Dewey, Okla.

Write

Dewey Portland Cement Co.

Dewey, Okla.

200 AMP. General Electric Arc Welder; portable; 220 V. 3 ph. 60 cy. Complete. Like new. $350. 7x6 Ingersoll-Rand Type ER-1 Air Compressor. Like new. $225. 8x6 Ingersoll-Rand Type ER-1 Air Compressor. Like new. $250. 36"x18' Fifield Screw Cutting Lathe. $650. Also large stock of lathes, shapers, pipe machines, bolt threaders, etc. Send for our list. Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West Second St., Cincinnati, Ohio.

20 Waukesha engines, heavy-duty, 4-cyl., 120 H.P. Cheap.
MERTES MACHINERY CO.
1622 S. First St., Milwaukee, Wis.

LATE MODEL diamond core drill, also light rotary. Address Box E-973, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE—All equipment from two dismantled Dubbs Cracking Plants, including two Dow surge pumps with less than 18 months' service, Worthington duplex steam pumps, Key & Ohiolock headers. Tagliabue pressure controllers and variety of forged and cast steel fittings. Material in first-class condition and subject to inspection. Address Box E-842, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE
Second hand material—8¼" casing 3,000'; 6¼" casing 110,000'; 4⅞" casing 7,000'; 2" tubing 150,000'; 2" pipe 75,000'; engines, powers, tanks, rods, jacks, pulling machines. PRICES ON APPLICATION. RECAM COMPANY, Phone 525, CHERRYVALE, KANSAS.

FOR SALE—EQUIPMENT

5 MILES of 4" pipe, some 2 and 3" pipe, 16x6 Ingersoll-Rand Air Compressor with automatic governor, 10 H.P. motor, air receiver, pop. gauge, belting, all complete, 6,000, 8,000, 10,000 and 12,000-gallon storage tanks. Priced to move quick. Address Carnes Equipment Co., Sand Springs, Okla.

BARBER-GREENE Ditchers, three Model 44-C, one 19-inch boom Pipe Line Special, new; two 12-inch booms; ten 2-ton, one 5-ton Kingham pipe trailers. Address Box E-880, The Oil and Gas Journal, Tulsa, Okla.

30,000 ft. of 2-inch, 1,800 lb. test at .06 per foot. 10,000 ft. of 8¼-inch 24x28 lb. test at .45 per foot. This pipe in A-1 condition. Prices f.o.b. Tulsa. Write Box E-960, The Oil and Gas Journal, Tulsa, Okla.

BUSINESS OPPORTUNITIES

INVESTORS, experienced oil men and geologists are drilling geological structures in Texas. Require $25,000 additional capital. If in a position to invest $250, get details our startling offer. Money secured, A 1 references. Investigate as you never had opportunity to equal it. Address Box E-953, The Oil and Gas Journal, Tulsa, Okla.

EXCEPTIONAL opportunity for experienced oil man or royalty specialist with dependable connections to join investment broker opening eastern offices for sale of royalties. Partnership or profit-sharing basis. Give full particulars. Address Box E-952, The Oil and Gas Journal, Tulsa, Okla.

EASTERN broker with select clientele is in the market for good producing royalties. Opportunity for permanent connections if prices are right. Address Box E-951, The Oil and Gas Journal, Tulsa, Okla.

WITH $10,000 CAPITAL — Believe can make a profit of $100,000 in six months' time trading in commodities. Time is here now. Years of experience. GREGG SNYDER, 25 Broadway, New York.

FOR SALE, Mr. Driller—5,000 acres in Oklahoma. Best geology. Attractive chance for drilling. Quick action. E. A. Hoff, 4819 Jarboe, Kansas City, Mo.

OIL located before drilling. Geophysical method. Toggodometer Instrument; take pay in oil. No oil, no pay, except traveling and testing expenses. 95 per cent accuracy. O. P. Coffin, Caddo, Tex.

WANTED—Seismic shot holes, shallow production or core drilling contracts. Ritter-Dugan Drilling Co., Perry, Okla.

$8.00 BUYS Deed, part oil, 10 acres, Oklahoma County—MANY WELLS NOW DRILLING. Joe Milam, Dept. 43, Oklahoma City, Oklahoma.

WANTED PETROLEUM PRODUCTS
We will pay cash for job lots of lubricating oils, distillates, fuel oils or we will advance money to the refiner manufacturing same and needing cash. We will advance cash on crude in storage if price is low enough. Address Box E-970, The Oil and Gas Journal, Tulsa, Okla.

WANT FINANCIAL PARTNER to assist in development of gold mining property quartz in proven district. Will give interest. John Rodanic, Box 715, Rock Springs, Wyo.

UTILITIES WANTED
We are in the market for utilities both gas and electric. Send all details.
Donovan Construction Co.,
Builders Exchange Bldg.,
St. Paul, Minn.

PETROLEUM PRODUCTS broker with excellent clientele wishes to communicate with refiners, marketers and compounders of Mid-Continent paraffin base and Pennsylvania lubricating oils regarding Pacific Coast distribution. Address C. Williams, 2519 Washington Blvd., Ocean Park, Calif.

BUSINESS OPPORTUNITIES

MANY GREAT BARGAINS—Copper, Lead, Silver or Gold—Have no partners. C. J. Greene, Sells, Arizona.

FOR SALE—Oil and Gas land 235 acres, two proven wells drilled. Center New Field Hart and Berren Co., Ky. This is your chance for a real bargain. For more information, write P. O. Box 45, Cave, Ky.

SITUATIONS WANTED

MORE THAN 12 years experience in the Natural Gasoline and Refinery business doing construction work, operation of plants, gas testing, fractional analysis and office work. A college graduate. R. B. Whitton, Timpson, Texas.

MANAGER AND SUPERINTENDENT
Graduate engineer, 12 years oil field experience with major and independent companies, in geological, scouting, land and leasing, drilling and production departments. Thoroughly experienced oil field manager with exceptional reference. Will accept position in any of above departments or in charge of operations or developments. Write Box E-972, The Oil and Gas Journal, Tulsa, Okla.

LAND AND LEASE MAN
College graduate, age 32, several years oil and gas experience, checking and buying leases and producing properties. Excellent references. Write Box 971, The Oil and Gas Journal, Tulsa, Okla.

HELP WANTED

PIPELINERS, Welders, Mechanics, Operators, Carpenters, Bricklayers and other tradesmen send stamped envelope for interesting information regarding employment. P. O. Box 1523, San Antonio, Texas.

OIL INDUSTRY PRINTING

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

RANCHES AND FARM LANDS

RANCH land in Texas and New Mexico, 40 acres to 400,000 acres, improved or unimproved, $2 per acre up; cash, terms or trade for business property, stocks or bonds. Amos Poe, Andrews Building, Dallas, Tex.

ROYALTIES—PRODUCTION

JAMES B. McANALLY
Speculative and Investment Royalties
Hunt Building, Tulsa, Okla.
Service to dealers, Oklahoma, Kansas and East Texas.

ROYALTIES in the territory of coming big development in Kansas, Stafford, Barton, Ellsworth, Kingman and Stevens Counties, core drilled. Also producing royalties. Special service to brokers. Send for list. James R. Haynes, Grantville, Kans.

OKLAHOMA producing royalties specializing in Oklahoma City Field.
Chester Imes
Petroleum Bldg. Oklahoma City

MONTHLY INCOME-paying Royalties under Oklahoma City and Seminole Wilcox Sand wells offered. W. E. Cook, 342 Court Arcade, Tulsa, Oklahoma.

For INCOME AND SPECULATIVE Oil Royalties for Investment, write
SPENCER ROYALTIES CO.
Thompson Bldg., Tulsa, Okla.

Kansas Royalties offsetting Midwest well, Stafford County. Hugoton Gas Royalties. Lists, maps free. Harry Haynes, Grantville, Kans.

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Changes in copy must be in our office 10 days in advance of publication date.

Mail your advertisement to the Largest Classified Section in the Oil Industry.

THE OIL AND GAS JOURNAL
TULSA OKLAHOMA

ROYALTIES PRODUCTION

PRODUCING ROYALTIES
Specializing in East Texas
John L. Dickson, Box 1037, Tulsa, Okla.

UNUSUAL OPPORTUNITIES FOR ROYALTY INVESTORS AND DISTRIBUTORS

THE MERCURY COMPANY
Philtower Building, Tulsa, Oklahoma

LEASES—PRODUCTION

LAND, the source of all wealth, the only safe investment, all royalty—on structure—new survey adjoining location—oil fields—Oklahoma County—best geology—three 40-acre tracts—one 40 sells in $100 shares. Geo. W. Seckman, Edmond, Okla.

VALUES ARE DEFLATED
Are you interested in oil and gas properties that meet your requirements and can pass inspection? Principals who are in the market, by stating specifications, can receive expert guidance and valuable information without obligation.
A. D. LAMM, Engineer
411 S. Elwood Ave. Tulsa, Okla.

TEXAS PANHANDLE Gas Production and Royalties is my Hobby—get my prices. Wire or write. E. B. Reeves, Box 13, Alanreed, Gray County, Texas.

LEASES—Barton Ellsworth Arch territory in Stafford County, Kansas. Write today. James R. Haynes, Grantville, Kansas.

FOR LEASE—1,206 acres, Bee County, 13 miles southwest from Pettus, 7 miles west Simms big gasser. Want $1 rental. Lacks & Knight, San Antonio, Tex.

WINKLER County leases and royalties bought and sold, both producing and wildcat. G. C. Dawson, Kermit, Tex. Box 21.

W ½ NW ¼, 19-7N-58, Weld Co., Colorado. Near New Raymer. Will sell land subject oil lease or part or all landowners' royalty. Associated Stockholders, Inc., Linden Hills, Minneapolis, Minn.

FOR SALE—40-acre lease, Section 12, Block B-12, Winkler County, Texas, Northeast quarter. Reasonable offer won't be refused. John Lofevaki, 2253 S. Sacramento Ave., Chicago, Ill.

HOT EAST TEXAS Woodbine Wildcat just starting 50 to 1 bet few weeks. E. Croft, Proctor, Texas.

ROYALTIES on top Major Company core drilled structures. Ellsworth-Barton Arch area. Western Kansas. Write W. C. Hallam, 802 Patterson Bldg., Denver, Colo.

CANADIAN FIELDS

(Continued from Page 43)

while Texas Oil Co. subleased some acreage from Lethbridge Petroleums, Ltd. In addition to these holdings, both Imperial Oil, Ltd., and Texas Oil Co. secured additional acreage by filings of their own and the structure in the immediate vicinity of Texas-Imperial's No. 1 is understood to be pretty well covered. Drilling has been in progress since December 1, 1930.

Twin River Test

To the southeast, Parco Oil Co.'s No. 1 Twin River, LSD 16, Section 34-1-29w4, has been held up in its production test by breakage of the pumping equipment, due to the exceedingly cold weather. Some crude has been pumped, but the test has not been sufficiently continuous to justify any estimate of the potentialities of the well. Pressure is reported to head up when the well is closed, but the amount of crude taken out has not been very large. The test may show a fair commercial production, but if it does not, it will likely be given a shot.

Northwest of Texas-Imperial's No. 1 Hudson's Bay Oil & Gas Co.'s No. 1 Keho, LSD 2, Section 17-11-22w4, is reported standing cemented at 4,920 feet and waiting for improved weather before sidetracking tools and testing production.

South Turner Valley

In South Turner Valley, Hylo Oils' No. 1, LSD 12, Section 4-19-2w5, is drilling in the belemnite formation below 5,450 feet and should get the lime at about 5,500 feet. The test is reported still bailing around 90 bbls. of light crude from the Home sand, the smaller delivery in January being due to a break in the line, during which oil accumulated. The test should get production in the Madison lime some time in March.

Central Turner Valley

In Central Turner Valley, Dome Oils' No. 2, LSD 16, Section 36-19-3w5, has resumed cleaning out the bridge which formed when the well was shot in the lime at 5,370 feet. Considerable wet gas is blowing. McLeod Oil Co.'s No. 1, LSD 16, Section 1-20-3w5, is cleaning out below 3,720 feet and pounding on iron, with somewhat increased gas production from the lime.

Acadia Valley Test

In the Acadia Valley south of Oyen, Fuego Oils, Ltd., of Toronto, is reported preparing to start its No. 2 test this spring. Fuego's No. 1, Section 34-25-4w4, was drilled some years ago to 3,165 feet encountering shows of heavy crude at various depths. Owing to drilling difficulties the well was not put into production, though a show indicating commercial production was claimed.

Border Fields

In the southern Alberta border fields, Commonwealth Petroleums' No. 1, LSD 8, Section 9-3-15w4, is reported coring in the lower Devonian lime below 5,142 feet with the hole full of water. Recent cores are reported to have shown further slight traces of oil.

Gas Test at Brooks

In southern Alberta, Canadian Western Natural Gas, Light, Heat & Power Co.'s No. 5, south of Brooks, is reported coring from 1,140 feet and is believed close to the gas sand. Canadian Western's No. 4 got a production of around 250,000 feet.

Reserve Dome Drilling

On the Alberta end of the international Reserve Dome structure, east of Coutts, plans are being made for resumption of Mayland Southern's No. 1, LSD 13, Section 4-1-9w4, which has been shut down at 2,750 feet. Gas estimated as high as 12,000,000 feet has been encountered in the upper sands; and drilling is to be continued to the Ellis-Madison contact, looked for around 2,950 feet. Some 11 townships farther west, Parco Oil Co.'s No. 1 got an oil show in the top of the Madison at 3,870 feet. The log indicates the Ellis-Madison contact in Mayland Southern's No. 1 will be over 800 feet higher, and the finding of oil or gas in this horizon would have an important bearing.

British Columbia Tests

In the Sage Creek district, southeastern British Columbia, Crow's Nest-Glacier Oil Co.'s No. 1, which was carried to 3,265 feet some years ago, is preparing to resume.

In the Quesnel district, Frank Patrick Syndicate's No. 1 on the Australian ranch is reported preparing to resume, after standing for some months at 1,400 feet. United Development Co. is reported planning to complete the Pacific Petrol Products' No. 1 test near Dorr, which has been standing at 820 feet.

Red Coulee Test

On the Montana end of the Red Coulee structure, Cosmos Petroleum Co.'s No. 3 Iowa, SE Section 2-37-4w, is reported plugging off water preparatory to testing production. Fluid was reported standing 2,200 feet in the hole. It is thought good for 100 bbls. a day.

Alberta Conservation Plans

Announcement has been made by J. E. Brownlee, premier of Alberta, that the provincial government will very shortly introduce legislation embodying its conservation proposals for the Turner Valley Field.

Premier Brownlee stated that if the Turner Valley gas wastage was not checked, there would be a gas shortage within three years. To produce 1 bbl. of naphtha required from 34,000 to 880,000 feet of gas.

Drilling in Ontario

In the Norfolk-Elgin area of southwestern Ontario, Dominion Natural Gas Co. has finished a new producer on the W. F. Kingston farm near Mabee's Corners. Gas was encountered at the comparatively shallow depth of 1,100 feet, with an estimated open flow of 500,000 feet. A new test has been started and it is reported that a total of eight wells are to be drilled. Acme Gas & Oil Co. of Toronto last year completed its eighth well in same general area. Of the eight Acme tests, seven were producers.

In Brooke Township, Lambton County, Michigan Pacific Oil & Gas Co.'s No. 1, Lot 10, Concession 12, is preparing to resume after running 5¼-inch casing to approximately 1,100 feet. In the Oil Springs Field, Sarnia Oil & Gas Co.'s test in Lot 18, Concession 2, Enniskillen Township, finished at 2,095 feet after getting three gas shows aggregating 50,000 feet, which a shot increased to 60,000 feet.

In Middlesex County, George Porter and associates of Westfreid, N. Y., are planning to drill for gas near Glencoe.

Haldimand Gas Field

Drilling operations are being carried on in Seneca Township, Haldimand County, Ontario, by Newcastle Oil & Mining Co. The company has finished three gassers with a fair commercial production which is being delivered to the Dominion Natural Gas Co. under 10-year contract at 30 cents per 1,000 feet. Newcastle's No. 4 is drilling. The company also holds leases on 1,300 acres in Middlesex County and some acreage in the Turner Valley Field.

KANSAS FIELDS

(Continued from Page 34)

A pipe line connection is being made to the wildcat well recently completed by the Shell Petroleum Corp. in Section 35-19-3w, McPherson County, by the Kansas Power & Light Co. The well is No. 1 Johnson, in Section 35-19-3w, and makes 13,000,000 feet of gas a day and an estimated 350 bbls. of oil a day.

Another semiwildcat test was announced in the area known as the Burrton area in northeastern Reno and northwestern Harvey Counties. This area is located on the trend extending south from the Voshell Pool, of McPherson County. Jasper & Beschka's No. 1 Voshell, NE cor. SW Section 3-23-3w, is a new location. It is located on a block of 700 acres about 4 miles southeast of F. Hollows' No. 1 Church Acre well. It is also located within three-quarters of a mile of an old gas well drilled several years ago. Gas from it will be used as fuel.

Cowley County

Roth & Faurot's No. 1 Cavitt, Lot 8, Block 14, Reynolds College View addition to the city of Winfield, Section 22-32-4, has been deepened to Siliceous lime at 3,268-75½ feet and completed for 300 bbls.

Ellsworth County

Robertson and others' No. 2 Stratman, SW cor. SE NE Section 1-17-10w, is a cellar. J. Robertson and others' No. 1 Stratman, SE cor. SW NE Section 1-17-10w, has been completed for 1,717 bbls. in Siliceous lime at 3,267-77½ feet.

Greenwood County

Marcus and others' No. 1 McConnoughty, NE cor. NW NE Section 36-24-12, has been completed for 30 bbls. in sand at 1,629-50 feet, total depth 1,654 feet.

McPherson County

Darby Petroleum Corp. made location for No. 1 Coons, NE cor. SW Section 20-19-1w. Derby Oil Co. and others staked location for No. 2 Lacquemont, NW cor. SE Section 20-19-1w, Ritz-Canton area. Derby Oil Co. and The Texas Company's No. 2 Unruh, SW cor. SE Section 26-19-2w, is a cellar. Pulse and Gypsy Oil Co.'s No. 1 McGill, NW cor. SE Section 7-20-1w, is moving in. Mid-Kansas Oil & Gas Co. is building the rig for No. 1 Bridgens, NE cor. NW SW Section 2-20-3w.

Morris County

Allender and others' No. 1 Wycoff, C SW SE Section 5-17-7, is dry and abandoned at 661 feet.

Rice County

Liggett and others' No. 1 Thodel, C NW NW Section 11-21-7w, is moving in.

Russell County

Signal Oil Co. and others' No. 2 Rude, NW cor. SE SE Section 28-15-13w, has been abandoned at 3,432 feet.

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 33)

LINCOLN COUNTY

Hilton Phillip's No. 1 Phillips, SW NW Sec. 2-14-3.....Drlg. 1,100 ft.
Mote et al's No. 1 School Land, NW cor. Sec. 36-17-5...S.D. 1,160 ft.

OKLAHOMA COUNTY

Citizens Oil Co.'s No. 1 Sage Barber, NE cor. Sec. 21-11-3w .....S.D. 1,200 ft.
L. C. Hivick's No. 1 Sunset Addition, NW SW NW Sec. 17-11-3w .....S.D. 5,515 ft.

PAWNEE COUNTY

Rookstool's No. 1 Wylie, NW NE SW Sec. 6-20-5 .....S.D. 1,950 ft.

PITTSBURG COUNTY

Tape Oil Co.'s No. 1 Fulton, SE Sec. 34-7-14 .....S.D. 1,200 ft.
J. Morrison's No. 1 Fowler, NE SE Sec. 13-7-17 .....Rig.
C. Kennedy's No. 1 Travis, C SW NE Sec. 15-7-14 .....Rig.
C. Canady's No. 1 Jones, NW cor. Sec. 14-8-14 .....Rig.

ROGER MILLS COUNTY

Ute Oil Co.'s No. 1 Williams, C SW Sec. 23-12-34w.....C.O. 5,150 ft.
L. C. Hivick's No. 1 Davis, C NW NE Sec. 4-11-26w.....S.D. 3,420 ft.

WASHITA COUNTY

Miley Pet. Co.'s No. 1 Wolfe, NE SW Sec. 23-9-17w.....Rig.
Cooper & Terhune's No. 1 Blocker, NW cor. Sec. 29-8-19w .....Drlg. 2,740 ft.; show oil 2,459-67 ft.; S.D. 2,757 ft.
Burns & Prince's No. 1 Deck, SW cor. Sec. 21-8-18 .....S.D. 1,265 ft.

OKLAHOMA PANHANDLE

TEXAS COUNTY

Three Way Oil Co.'s No. 1 Crane, SW NW Sec. 11-1-1E..T.D. 4,720 ft.; to cement.

SOUTHERN OKLAHOMA

ATOKA COUNTY

Brookshire's No. 1 R. W. Rowland, NW NE SE Sec. 18-3s-10 .....S.D. 1,720 ft.

BRYAN COUNTY

Bryan County Oil's No. 1 Childs, NW SE SW Sec. 7-7-10..T.D. 650 ft.
Bush et al's No. 1 Commerce Trust, NE cor. Sec. 35-6s-9 .....T.D. 740 ft.; plugged back to 450-80 ft.
Whalem et al's No. 1 Mason, NW SE SW Sec. 24-6s-9....Dlg. 845 ft.

CARTER COUNTY

Lundy's No. 1 Spraggins, C NE NW SW Sec. 8-1s-2w....Drlg. 1,750 ft.

JEFFERSON COUNTY

Smith's No. 1 McCarty, SE NW NE Sec. 18-4s-8w.....Location.

LOVE COUNTY

Schemerhorn et al's No. 1 Bourland, NE NW SW Sec. 1-6s-1 .....Drlg. 1,170 ft.

MARSHALL COUNTY

Starrett et al's No. 1 Henry, NE NW Sec. 22-7s-6 .....Rig.
F. H. E. Oil Co.'s No. 1 Beard, NW SE Sec. 3-8s-6.....Drlg. 225 ft.
Everett et al's No. 1 Agres, SE NE Sec. 14-7s-6 .....S.D. 1,170 ft.
Newman et al's No. 1 Henry, NW cor. Sec. 22-7s-6 .....Rig.

McCURTAIN COUNTY

Prassell et al's No. 1 Wagoner, SE NE Sec. 5-8s-27 .....Drlg. 200 ft.
Stampfs et al's No. 1 Harris, SW NW SW Sec. 14-9s-25..S.D. 2,710 ft.
Stewart's No. 1 Patterson, C SE SE Sec. 7-6s-24 .....Drlg. 1,120 ft.

PUSHMATAHA COUNTY

Whitehead et al's No. 1 Messer, SE SW SW Sec. 35-3s-18 .....Drlg. 840 ft.

STEPHENS COUNTY

Dameron & Brock's No. 1 Dameron, SE SW NE Sec. 11-3s-6w .....Drlg. 340 ft.
Brown's No. 1 Hightower, SW SE NE Sec. 15-3s-5w.....Sand 990-1,004 ft.; S.O.; S.D.
George's No. 1 Ryan, NW SW NE Sec. 31-3-15 .....Drlg. 360 ft.

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Chicago Area Thinks Bottom Reached

Refineries Are Reported Planning Drastic Cuts in Crude Runs. Mild Winter Affects Burning Oil Consumption Despite Increase in Burners

By Robert C. Conine

Chicago Bureau, The Oil and Gas Journal, 6 North Michigan Ave.

CHICAGO, Feb. 22.—Absence of further price recessions in the refined petroleum products tank car markets Monday is giving some basis to the feeling in oil trade circles here that quotations have sounded the lowest level which may be reached while current crude oil and tank wagon postings are in effect. The spot movement in gasolines has been light, as may be expected at this time of year, and materials have been offered more freely, but resellers are admitting that the reported huge quantities of low octane gasoline available is not enabling them to buy below 2⅝ cents in any quantities, although small quantities of dubious quality may be picked up in the field at 2½ cents. This latter material probably compares in importance to the gasoline produced by a tiny refinery which is operating in a Chicago suburb. This plant runs Mount Pleasant crude oil and produces a 64-66 gravity, 410 endpoint gasoline, of octane rating considerably below that of any Mid-Continent material, which it delivers in Milwaukee at 5 cents. The price figured back to an Oklahoma refinery would be 1.8 cents a gallon.

Refinery executives in Chicago, who have refrained from expressing themselves in the past when the necessity for reducing crude oil runs to stills was pointed out, now declare that such a reduction is imperative.

Refiners Must Cut Runs Immediately

In Chicago oil trade circles the blame for the industry's depressed markets rests solely on the shoulders of the refiners, while the onus is somewhat lightened by the fact that gauging of requirements has been made more difficult by deceptive demand estimates based on gasoline tax returns and by mild weather. While seasonal conditions have kept consumption of gasoline down to a low level for the past few weeks, the weather has not been such as to bring about a real movement in heating oils. It is not cold enough to require more than a few hours of heating a day, but it is too cold to encourage motoring for pleasure. Snows and rains have contributed to the current slump in gallonage and many of the dirt roads are reported in bad condition.

There is apparently no prospect that domestic consumption will be boosted by heating oil refill requirements. Distributors and jobbers say that thousands of home and apartment users have been able to save considerably on their heating bill and will depend on the remainder of their storage to carry them through the mildest winter in Chicago records. The decline in consumption has been much less than it might have been for the reason that the use of oil heating equipment has increased greatly. These additional users are providing a steady, if not heavy, movement of fuels and prices are considered firm at present levels.

More Middle and High Octane Offered

Two major refiners have been buying middle and high octane gasoline which meets their specifications and they report that their purchases have not been large, a 200-car order in one case and weekly purchases of 5 to 10 cars in the other, because no considerable quantities of suitable material are available. However, the price differential among the low, middle and high octane gasolines is now admitted to be less than has been consistently reported in the past. The new figures conform to the price schedule given in The Oil and Gas Journal, that is, a half-cent higher for the middle octane gasoline, and three-quarters of a cent higher for the high octane material. Last week a major refiner received a large movement offer of high octane gasoline, guaranteed in the upper part of the antiknock range, at 3¾ cents, and turned it down.

Buyers of antiknock gasoline are becoming very exacting in the matter of color and odor, and sellers of material slightly off color or odor are finding it necessary to cut their prices to the levels of low octane gasoline. This is likewise the expedient of sellers of gasoline in the lower part of the middle octane range. In fact, several refiners say that if price is considered the middle octane range may well be taken as between 61 and 65 octane number. One refiner is meeting color objections, with unknown results, by adding a color neutralizing agent. It remains now for some one to discover a method of masking the odor. One may be forgiven a suspecting nature, but it does seem that buyers are excessively sensitive to color and odor in many cases where other and far more important specifications are above par, but such is the case and it is up to the refiner to treat his material to meet the exacting demands of his customers or be content to obtain a lower price. It is expected that very shortly two different treating processes wil be announced which will make processing cheaper, will give good color and odor, conserve the antiknock value, and will do much to eliminate the pseudogum problem. Another indication that refiners in Chicago district are planning a considerable extension of their cracking operations to produce antiknock gasoline is given in the fact that large expenditures have been made by a gas company to take refinery gas from two major refiners. This gas company is negotiating with a third major operator for additional gas which will be mixed with its coal gas to raise the B.t.u. to 1,000. Another large refiner is known to be making changes in the plant for greater utilization of dry refinery gases.

The New Gasoline Contract

The new gasoline contract which provides maximum and minimum of 4½ cents and 5½ cents with split above and below appears not to be going over so well. It seems that a majority of the larger marketers are not going to allow the new contract to lose them business. Other refiners say that they will adhere to the contract until they are forced to abandon it. Several neat dodges whereby a refiner may have his cake and eat it have been worked out. One refiner makes it a point to emphasize to the buyer that although he is asked to sign the new contract the prices will be based "on our own spot market" whatever that is, making the inference clear that the buyer will not lose anything by accepting the new agreement form. Another refiner modifies the contract to the extent of placing the top at 5 cents. Another skirts around the contract entirely by merely extending his older contracts which in some cases permits the buyer to take goods at three-eighths cent below the low. Where the contract is ostensibly adhered to the alternative of buying on the spot market represents most of the movement. Jobbers are complaining that the refiners are expanding the practice of selling direct to consumer and are making discounts which enable even farmers and similar accounts to buy on the same basis as the jobber. Refiners, in turn, complain that distributors and jobbers are taking their customers by underselling them with their own material. One major refiner found himself in an embarrassing position when a large commercial account notified him that a broker was offering the refiner's material at a price well below that which the commercial buyer was having to pay the refiner on a year's contract. As a result this refiner has "sworn off" all brokers and unaffiliated distributors.

Interesting Trackage Developments

Probably the most important news on the retail side is the sentence imposed last week on a gasoline tax evader. Abe Allen, head of Midway Refining Co., must serve three years in the house of correction and pay a fine of $3,000 following conviction on charges of defrauding the State of $26,000 in gasoline taxes. Mr. Allen is at liberty on a 45-day stay of mittimus during which he may appeal his case. Motion for a new trial was denied. This is the first imprisonment sentence imposed in the United States for evasion of the gasoline tax.

The waning popularity of premiums at trackage stations has called for spectacular action on the part of the cut price filling station operators. Officials of an insurance company have been closeted with the state authorities in Springfield and are expected to bring out soon a new kind of premium which will automatically call for repeat sales at least once a week. The proposition is to give the customer an accident policy good for one week with every 7 gallons of gasoline. Each policy insures the holder to the extent of $1,000 and each buyer may hold three policies. The policies may be issued to anyone between the ages of 18 and 70 years, and will cost the filling station operator 10 cents each. The policy is understood to be one of those commonly known as a "steam boat policy," that is, the holder may collect if he is struck by a steam boat while walking down Michigan Avenue. If estimates which have been made on the cost of foodstuffs, and other goods to which the premiums have graduated are correct, the service station operator will save 2 cents on each sale of 7 gallons, and the policies will have to be renewed every week.

The current low natural gasoline markets have brought about a considerable activity in blending. One distributor reports that he has been able to obtain a natural gasoline of 95 per cent recovery and 22 pounds vapor tension, with an octane rating of 70 (his description) for 1½ cents, which he blends with either naphtha or low octane U. S. Motor gasoline for a profit of at least $80 a tank car. Where this gasoline blend is offered at the service stations the motorist is informed by huge posters that the motor fuel is 66-70 gravity and that it will not knock in any automobile engine. A new cut price station in South Chicago has over a dozen pumps and offers three grades of gasoline, each distinguished by gravity.

Tank Wagon Continues Firm

The gasoline tank wagon markets continue firm at the beginning of this week, although there is some feeling that various new types of discounts off these markets and the service station postings must be eliminated if the posted tank wagon markets are to be appraised on their face. In the third grade price cutting over the territory continues. The reductions are principally in the smaller towns. Observers do not look for any disturbance in the regular grade markets.

Gasoline Tank Car Markets

The gasoline tank car markets are unchanged in price this week and there is more inclination to the view that the bottom has been reached and that the unfavorable factors now present have been discounted beforehand. The problem is still what to do with the mounting stocks of straightrun gasoline, and it appears certain that the third grade outlet does not offer a solution. The marketers are building up their middle and high octane gasoline storage and it seems obvious that the straightrun material will be in the way until it is reformed. Movement of gasoline has been light for months, but is now on the increase slowly. The low point is believed to have been reached the first week of this month. The ruling gasoline tank car markets in Chicago district Monday are: U. S. Motor, 2¾ to 3 cents; 60-62, 400 endpoint gasoline, 3 to 3¼ cents; 64-66, 375 endpoint gasoline, 3⅝ to 4 cents; aviation, fighting grade, 4½ to 5 cents; 68-70 360 endpoint gasoline, 4 to 4¼ cents. As pointed out above, there is less price shading in evidence and resellers are finding it difficult to get the lows available earlier in the year. In fact, a sales representative who made a 2½-cent quotation on material to be delivered over a month was rewarded for his zeal by being fired. It has always been thought here that marketers allowed their representatives too much latitude.

Naphtha Tank Car Markets

February is showing a considerable improvement in the movement of naphthas used in paint making. One of the larger sellers says that business in these materials, especially V.M.&P. naphthas, has already surpassed that of February, 1931. The lacquer diluent business is quite as good, but the volume of sales never compares with those of V.M.&P. naphtha and paint thinner or petroleum spirits. Rubber solvents are also reflecting increased industrial activity. Cleaners' naphtha and Stoddard solvent continue in fair demand. According to some marketers, the naphtha tank car markets may not be expected to show price advances until the gasoline markets are better. In the naphtha tank wagon markets there is somewhat more uncertainty in the matter of price and several price cuts have been reported, especially in the St. Louis and Minneapolis districts. In rubber solvents the special prices offered in certain districts, such as Akron, have not been as low as expected. A report on crude rubber consumption in January showed a 30.6 per cent seasonal increase over the preceding month. The naphtha tank car markets Monday were unchanged.

Kerosene Tank Car Markets

The kerosene tank car markets are showing practically no activity and prices continue unchanged over last week.

Fuel Oils and Gas Oils

A fair demand continues for heating oils, while the heavy fuels are rather slow. Scarcity of prime white distillate is giving the 38-40 light straw material a better position at prices quoted for the prime white, that is, 2⅛ to 2¼ cents. Prices for the entire list are considered firm although there has been some trouble from shippers to differential points. However, a large part of the differential shipping is for eastern points as far as Ohio and do not figure on the Group 3 basis which would show losses to Oklahoma refiners.

Burning oil distributors in Chicago district have apparently ironed out their differences, and the adoption by the majority of them of a uniform contract promises to bring about the first real improvement in the distributing and jobbing ends of the business. Another slight improvement noted in the distillate markets was a narrowing in the price margin for 32-36 straw material to 1⅞ and 2 cents. The 32-36 industrial gas oil is probably the dullest in the list.

Export Buying of Lubs and Wax in East

Effort to Anticipate English Tariff Produces Temporary Flurry. Gasoline Gallonage Ahead of Last Year's Consumption in East

By A. E. Mo[illegible]der
New York Bureau, The Oil and Gas Journal, Rooms 1919-21, No. 154 Nassau Street

NEW YORK, Feb. 22.—Heavier export buying of lubricating oils and paraffin wax for shipment to England to arrive before the new tariff law becomes effective March 1 featured East Coast refined products markets during the past week, the domestic market situation remaining routine in character.

Export buying was particularly active during the early part of the period, when buyers for shipment abroad were picking up spot stocks and materials rolling to New York, Philadelphia, or other ports where prompt loading for shipment to England could be arranged for. The foreign demand, which was emergency in character, lent some strength to the market, but because of its temporary nature has already lost most of its influence. Demand was centering on lubs and wax, it is understood, because the 10 per cent tariff impost will impose a particularly large burden on these products from the standpoint of total laid-down cost, and because adequate storage for extra stocks of these products is available. In the case of gasoline, kerosene and the other products, sufficient vacant storage in England does not exist for any emergency gathering of supplies, and the effect of the 10 per cent tariff on these oils is not sufficient to substantially increase their laid-down cost in the United Kingdom.

The new tariff law in England will give preference to refined petroleum shipments from Trinidad and other British oil-producing colonies and to this extent will cut into shipments from the United States to the United Kingdom. This reduction, however, will be compensated for, partially at least, by reduced shipments of gasoline and other oils from Trinidad to the United States.

The domestic market situation in East Coast area underwent little important modification. Gasoline markets weakened somewhat under the influence of the sharp increase in refinery stocks, as well as lessened consumption in some parts of the territory, but posted prices at the refineries were unchanged. Retail gasoline quotations in New York State are scheduled for a 1-cent advance on March 1 when the new gasoline tax of 3 cents is expected to become effective.

Refinery Gasoline

Cold and stormy weather retarded demand during the early half of the week, but a sharp recovery in gallonage developed during the closing half under the stimulus of warmer weather and buying for the week-end holidays.

The posted price for antiknock U. S. Motor gasoline remained held at 6 to 6½ cents in tank car lots, f.o.b. terminals, according to sellers, and the cold weather made for a heavy demand for this product.

U. S. Motor gasoline under 65 octane number was posted in the tank car market at 5¾ cents with 5½ cents still possible in some directions. The sharp increase in refinery stocks during the previous week, amounting to more than 2,000,000 bbls. for the country as a whole, tended to weaken the market undertone, and jobbers were showing some apprehension regarding the stability of the market at present prices.

While distributors are favoring gasoline of 65 octane number and above in the tank car market at present, the extreme differential on so-called ordinary gasoline, which is available at 5½ cents and upward, is bringing more buying interest to this division. This situation is expectd to create somewhat of a problem for East Coast refiners when warmer weather arrives, and a pronounced drift toward the cheaper product, if the 1-cent differential still holds (and there is every likelihood such will be the case). Notwithstanding the sentiment that has been built up for the higher antiknock product, the gasoline market is still a highly competitive affair and warm weather motor requirements are much more elastic than during the cold months. In addition, the gasoline which is now being offered at the lower prices comes up to previous specifications for regular grades of gasolines in all respects, and jobbers are expected to use this grade widely for competitive purposes.

Notwithstanding the development of 65 octane number as the minimum antiknock rating for high-grade "regular" gasolines, East Coast refiners have not yet progressed to the point where ordinary U. S. Motor and gasoline of 65 octane number are firmly fixed in separate price brackets at established differentials, and adjustment of this situation is expected to prove a serious problem as the warmer weather and the season of heaviest consumption comes on.

Tank Wagon Gasoline

The feature of the market was the half cent reduction in retail quotations made effective throughout the greater part of Standard Oil Co. of New Jersey territory in midweek, other sellers following in the reduction. This was the only general change.

With New York's new gasoline tax rate established at 3 cents, it is expected tank wagon and service station prices will be advanced in conformity with the higher rate, which is expected to become effective March 1.

Gallonage in the East thus far in the year is reported ahead of that for the comparable period of 1931.

Kerosene

Colder weather brought out an improved demand for kerosene at the refineries last week, and a better undertone was in evidence, although the increase in spot business was not of sufficient amount to develop a higher market range. Posted prices for 41-43 water white in tank car lots ranged from 5¼ to 5½ cents, at terminals. Jobbers who had been out of the market for some time were coming back into the market later in the week for replacement supplies to take care of their storage requirements.

Tank wagon kerosene markets showed a considerable pick-up in gallonage, and the price structure was unchanged throughout the territory. Marketers reported that their kerosene sales at gasoline filling stations had shown a sharp spurt, in addition to the increased sales through other distributive channels.

Furnace Oil

Cold and stormy weather brought about a sharp increase in consuming demand, and tank car movement of all grades of furnace oils was more active. Jobbers were back in the market for stocks in considerable quantity, and rush shipment orders were frequent.

Tank wagon furnace oil gallonage was also sharply higher, with contract deliveries heavier. The change in the weather came at a time when retail markets were showing some signs of heaviness, and the market position has reacted strongly to the heavier volume.

Furnace oil marketers are considerably perturbed over the oil tariff situation, and have gone strongly on record as opposing the proposed import duties. The petroleum tariff measure, if enacted in its present form, will mean roughly an increase of 2 cents per gallon in furnace oil prices, it is believed, an average increase of more than 25 per cent for furnace oils as a group. Such an increase, it is feared, will sharply retard the sales of domestic oil burners, and will likewise react somewhat against industrial consumption.

Lubs

Heavier demand for bright stocks developed a stronger market feeling, and sellers advanced their quotations 1 cent, bringing the market up to 28 and 29 cents for light 140-150 and 27 to 28 cents for dark oil. Other cylinder oils were unchanged in price, but sellers reported demand was holding up better, and refiners were showing firmer price views on all grades. Considerable quantities of immediate shipment oil were booked for export to England.

Continued quiet featured the market for neutral oils, and prices were without change. Refiners reported tank car movement was of a hand-to-mouth nature, with contract withdrawals showing some signs of improvement.

Fuel Oil

Contract withdrawals held up and refiners continued to post 60 cents per barrel for bunker "C" in bulk, f.o.b. terminals, with the usual 5 cents per barrel charge for lightering alongside within harbor limits. A slight pick-up in marine demand has been evident, refiners declare.

Industrial movement of fuel oil was likewise well maintained and refiners were looking for some improvement in their shore business as business conditions continue to show improvement in several lines.

While East Coast refiners are still optimistic regarding the possibility of a higher market for their bunker oil sales, it is now felt that an advance in crude oil quotations will be necessary to bring the Gulf and California markets more into line with Atlantic Coast prices before any mark-up in bunker oil business can be made with a reasonable certainty of being maintained.

Gas Oil

Spot demand showed improvement, and contract gallonage also increased somewhat. Notwithstanding the better volume, the market is still oppressed by the heavy stocks on hand, and the price range holds at 3½ to 4 cents for 28 gravity plus recycled oil.

Refiners reported a considerable increase in shipments of low-grade gas oil for distribution as domestic burning fuel, and were of opinion a continuance of cold weather would substantially benefit the market structure through the clearance of further quantities of surplus stocks of the lower grades.

Diesel Oil

Diesel oil gallonage thus far in the year has been well maintained, and, while the normal increase in consumption experienced in marine sales in recent years has not been maintained in 1932, current volume is described as quite satisfactory.

The posted price for 28-30 Diesel oil remains unchanged at $1.30 per barrel, in bulk, f.o.b. terminals, plus 6½ cents per barrel for lighterage alongside within harbor limits, and contract withdrawals by marine interests are fully up to expectations.

Expanding consumption of Diesel oil in domestic consuming industries is being retarded somewhat by current slack industrial operations, but refiners look for steady improvement in this field as the year progresses.

Wax

The market for crude scale has witnessed a heavy movement, with buyers taking spot wax wherever available for immediate shipment to England. Large quantities of wax are being rushed into the United Kingdom with the idea of landing the material before March 1, when the new tariff becomes effective. Early in the week the spot market for 122-124 a.m.p. was up to 2.10 cents per pound, and buyers were scouring the market for stocks on spot here and rolling for Atlantic ports. With the time growing short for shipment, however, demand has eased off substantially, and the market is now down to a 2-cent basis, with quiet demand again prevalent.

There was some increased buying of fully refined grades for shipment to England, but the poundage on the refined grades was far below that on crude scale. Domestic demand for refined wax has likewise lagged, and the market is in rather irregular position. Spot 130-132 a.m.p. fully refined is offered at 3⅝ cents per pound, a quarter cent under the previous level, but 133-135 a.m.p., which is in shorter supply, has firmed up and is now held at 4 cents, up one-quarter cent.

Refiners are holding down wax production and are looking for higher prices when domestic consumers enter the market for materials in a larger way. The latter, on the other hand, are not inclined to extend the market much support and instead of contracting forward requirements, as was formerly their practice, are operating in the spot market in a hand-to-mouth fashion, covering their requirements as they develop.

Gulf Export Market

The market was enlivened by an inquiry from France for a 9,000-ton cargo of 64-66 gasoline for March shipment, but up to the time of writing the cargo had not been placed. Sellers were willing to book at 4⅝ cents, which was one-eighth cent under previous quotations, and it was indicated possibly 4½ cents could be done. Russia and Rumania were both reputedly quoting extremely low prices on this cargo, however, and it was feared the Gulf would lose the business.

Gulf kerosene prices were strongly held with trading quiet.

Venezuelan crude is moving out on term contract at 46 to 47 cents per barrel, and Panuco crude at 51 to 52 cents, plus taxes, but no new business developed in the crude oil division in the export market, either at the American Gulf or in the Caribbean area. The exemption of crude oil from the new British tariff is expected to result in some business on crude for shipment to United Kingdom refineries, but thus far nothing tangible in that direction has developed in the American market.

California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic and Gulf Coast ports for the week ended February 13 totaled 57,000 bbls., a daily average of 8,143 bbls., compared with 25,000 bbls., a daily average of 3,571 bbls. for the previous week, and a daily average of 23,429 bbls. for the four weeks ended February 13.

The 57,000 bbls. received during the week consisted entirely of gasoline, and was landed at New York, none of the other Atlantic Coast or Gulf Coast ports receiving California shipments.

There were three cargoes of California refined products reported shipped during the week for Atlantic Coast ports, as follows:

For New York—81,400 bbls. of gasoline on the Agwiworld (Richfield Oil Co.).

For Wilmington, N. C.—74,600 bbls. of

gasoline on the New York (The Texas Company).

For Philadelphia—114,000 bbls. of gasoline on the Northern Sun (Sun Oil Co.).

Petroleum Exports

With the exception of paraffin wax, export shipments of refined products locally showed some decrease during the week ended February 13. Volume of new business continued along restricted lines, and, while inquiries were still fairly numerous on export parcels, volume of actual business did not come up to sellers' expectations.

The following table shows refined petroleum exports from the local port for the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Feb. 13	Fe . 6	Jan. 30
Gasoline	15,000	140,000	52,000
Naphtha	21,000	650,000	350,000
Kerosene	18,000	175,000	55,000
Fuel oil	2,000	225,000	11,000
Lubricating oil	510,000	1,135,000	805,000
Petroleum, ref.	320,000	715,000	340,000
	Pounds		
Petrolatum	75,000	90,000	3,000
Paraffin wax	2,750,000	1,380,000	1,075,000
Refined		112,000	245,000
Scale	680,000	125,000	50,000
Lubricating grease	560,000	475,000	415,000

The increasing tendency of foreign consuming countries to impose heavier import and sales taxes on gasoline and other petroleum products is causing considerable concern to export operators, who see in this a further diminishing in their probable export outlets. Large integrated companies with foreign marketing subsidiaries are likewise affected, so far as their exporting operations from this country are concerned, but they are in position to purchase supplies at points nearer consuming markets and thus operate their foreign subsidiaries with a minimum of market disturbance.

Imports

Imports of crude and refined petroleum at the principal United States ports for the week ended February 13 totaled 1,348,000 bbls., a daily average of 192,571 bbls., compared with 1,359,000 bbls., a daily average of 194,143 bbls. for the previous week, and a daily average of 214,643 bbls. for the four weeks ended February 13. Details follow:

	Bbls. of 42 gals.
At Atlantic Coast ports—	
Baltimore	359,000
Boston	62,000
New York	584,000
Philadelphia	155,000
Others	167,000
Total	1,327,000
Daily average	189,571
At Gulf Coast ports—	
New Orleans and Baton Rouge	21,000
Total	21 000
Daily average	3,000
At Atlantic and Gulf Coast ports—	
Total	1,348,000
Daily average	1'2,57'
Daily average four weeks	214,643

Distribution of total imports is as follows:

Crude	683,000
Gasoline	373,000
Kerosene	4,000
Fuel oil	288,000

Another cargo of Rumanian gasoline is reported en route to a United States Atlantic port, north of Hatteras, and will probably enter the country at Baltimore. The cargo is approximately 55,000 bbls., and is expected to be transshipped to tank cars for final shipment to Detroit.

EASTERN FIELDS

(Continued from Page 48)

in Grant district, Marion County. In Fayette County, Grosscup and Schultz are rigged up to drill No. 5 on the Black Bestey Coal Co. property in Kanawha district, and have made locations for Nos. 6 and 7 on the same tract, and are drilling on the Loop Creek estate and have reached 2,500 feet.

H. C. Zogg has made a location for a third well on the Maddox heirs' farm in Scott district, Putnam County, as has also the Celia Oil & Gas Co. for a fifth well on the John Toomey lease in the same district. Lincoln County, next to Calhoun County, represents the greatest activity in this field, and has five wells drilling. In Union district, the Hamlin Natural Gas Co. is down 1,850 feet on the Roy and Hal Adkins farm. In the same district, the Woodyal Gas Co. reached the sand in a second test on the Charlie Honaker farm and shot it. It is cleaning out preparatory to testing. In Jefferson district, the United Fuel Gas Co. has its No. 8 on the Courtney Land Co. lease down to 2,275 feet. In this district, the Cambridge Gas Co. is still fishing in its second test on the A. M. Mullens farm at 1,765 feet. The Parsner Gas Co. has made a location for a second test on the Albert and Everett Elkins farm, Jefferson district, and the Hamlin Gas Co. has cleared one on the J. Miller farm in the same district. In Sheridan district, H. H. Dial has reached 1,443 feet on the Claude Peyton farm.

Kanawha County continues inactive in actual drilling with most attention being given to repairs and operation in this thickly drilled section. In Elk district, Grosscup and others remain shut down in their test on the Samuel M. Burdette farm at 4,758 feet. Ellyson and Tate have made no further progress in their test on the Virgil C. Tate farm, Union district, and stay shut down at 1,710 feet. The Pure Oil Co. and the Owens Illinois Glass Co. have rigs and tools ready for additional wells in Cabin Creek district but are slow to start.

SOUTHWEST PENNSYLVANIA

Southwest Pennsylvania presented no new completion and with the amount of active drilling in this division, future completions will be a rarity, as most of the wells are standing waiting for better developments.

In Beaver County, the test by the Andrews Brothers on the J. P. Ramsey farm in Hanover Township, reported dry at 1,200 feet has not been abandoned but is still standing with a view to deeper drilling. The test of the Swain Oil Co. on the A. L. Burg farm in Brush Creek Township is now drilling at 800 feet.

The West Virginia Natural Gas Co. has a rig standing on the S. W. Stout farm in East Finley Township and also one for a test on the Susan Stout farm. The test on the Henry Seik farm in Mount Pleasants Township belonging to the Hickory Penn Gas Co. is still standing at 1,350 feet as is William Dallmeyers' test on the Thomas Brown farm in Smith Township at 1,450 feet. In the same township, the test of the Hopewell Oil & Gas Co. on the Albert Noble farm is likewise standing at a depth of 1,350 feet. In Chartiers Township, a local company owns a test standing at 2,500 feet on the A. Woodruff farm and in East Finley Township, a local company has a rig standing for a third well on the Institute of Practical Arts property.

In Allegheny County, Shaffer & Co. are building a rig on the Henry Shaffer farm in North Fayette Township. This is for a third well. In Greene County, operations are virtually at a standstill with no reports of drilling.

CENTRAL WEST FIELDS

(Continued from Page 48)

is reported at 1,325 feet in No. 2 Howard Middleton, Section 10, same township.

In Athens County, Carthage Township. Fred Gunthal and others have drilled their second test on the Israel Swartz, Section 25, into the Keener sand from 1,192 to 1,225 feet, and are going to try to save the gas in the Salt and Maxon sands where fair gas was found and a packer will be set at a depth of 940 feet. The Nelsonville Gas Co. has shut down its test on the John Ward farm, Section 5, York Township, for the winter. Standard Natural Gas Co. found a gas pay in No. 8 on the James Bowden, Section 16, Waterloo Township, in the Berea sand from 1,146-50 feet, and shot it with 15 quarts and the hole filled up with several hundred feet of water, and attempts will be made to save the gas.

In Tuscarawas County, the Wiser Oil Co.'s test on the Holden Clay Products Co. property, Lot 9, Sandy Township, found the Niagara lime at 4,734 feet, with no showing of oil and gas, then found top of the Clinton at 4,953 feet and is still drilling.

Stark County

In Stark County, the East Ohio Gas Co. struck a light gas well in No. 4 T. K. Harris, Section 34, Jackson Township, due to the formation being badly broken up in the Clinton from 4,373-85 feet. Same company has a rig on the Elza Hall, Section 12, same township. Brendall and others have a fair gas well in No. 3 on the J. C. Steiner, Section 16, same township, in the Clinton from 4,245-75 feet. Wiser Oil Co. is drilling a second test on the Lake-O-Springs property, Section 14, same township, and the East Ohio Gas Co. made a location for a second test on the Leo Frank, same section. In Lawrence Township, same county, the Wittmer Oil & Gas Co. drilled in a very light gas well on the W. L. Keller and others, Section 11, in the Clinton at a total depth of 4,020 feet.

In Fairfield County, the City Natural Gas Works is drilling No. 3 Charles W. Moyer, Section 13, Pleasants Township, and is also drilling No. 3 William and Hattie Brucker, Section 2, Berne Township. Same company has moved in a rig on the John D. Shull farm, Section 30, Mation Township, Hocking County.

In Guernsey County, Jackson Township, W. C. Urban and others are drilling No. 3 Guernsey Valley Fair Grounds, Lot 22, and C. C. Wharton is drilling No. 2 Bessie Taylor, Section 13, Westland Township, same county.

In Carroll County, Turner and others' test on the John H. Scott, Section 29, Orange Township, is reported a dry hole.

In Meigs County, Lebanon Township, the Ohio Fuel Gas Co. has a gas showing in No. 1-5,610 on the C. W. Lisle, Section 19, in the Berea sand at a depth of 2,017 feet, also a showing for a fair gas well in No. 1-5,632 Henry Martin, Section 35, Salisbury Township, same county, in the Maxon sand.

In Lawrence County, Chartiers Oil & Gas Co.'s No. 1 Harry Smith, Section 13, Union Township, has a very light gas showing at 2,950 feet. C. C. Wolf and others are drilling on the William J. Suiter, Section 23, same township. Virginia & Ohio Gas Co. is reported around 1,900 feet in No. 1 Harry Smith, Section 24. Ralph Brothers are reported down around 2,100 feet in No. 4 T. A. Knull, Section 20, Perry Township. Frick and others are around 300 feet in No. 1 J. A. Stultz, Section 27, Rome Township, and Sears and others around 500 feet on the F. B. Gibson, Section 2, Upper Township, same county.

INDIANA

Compiled by Paul F. Simpson, state gas supervisor, Department of Conservation, Division of Geology, Indianapolis, Ind., by counties:

Daviess County — Ben D. Ruble has started a second well on the Bernard Gilloogy farm, NW Section 34, Harrison Township. No. 2 Alva C. Smith is being drilled in SE Section 4, same township, by Amsler & Gilmour.

Dubois County—Dubois County Oil & Gas Co. is drilling on the Anton Hopf farm in tthe SE Section 7, Madison Township.

Floyd County—The James A. Sharp test, NW Section 30, Georgetown Township, was abandoned by Brooks J. Johnston.

Fountain County—When last reported, No. 1 Gantz, drilled by the Fountain Oil & Gas Co. in Section 27, Troy Township, was down 1,700 feet.

Gibson County—No. 3 Agnes Haskins, SE Section 18, Washington Township, was completed by the Gib-Van Oil Co. with an initial production of 105 bbls. A fourth well has been started on the same farm. Offsetting this lease the Big Four Oil & Gas Co. completed No. 1 Lottie Hope at 1,290 feet, where an initial production of 150 bbls. was found. In the NE Section 2, Columbia Township the Knox Engineering Corp. is drilling No. 1 Carl C. Steel. The Indiana Southwestern Gas Corp. has completed a 5,000,000-foot gas well on the R. H. Oynett lease in Section 22, Columbia Township. It is also starting a second well on the G. B. Allen farm in the same section.

Harrison County—Brooks J. Johnston is drilling No. 1 Charles B. Burkhart NE Section 25, Jackson Township.

Hendricks County—The T. A. Reitzel test drilled by the French Development Corp. in Section 8, Liberty Township, is drilling at more than 2,700 feet.

Knox County — James H. Gardner found a dry hole in No. 1 Union Investment Co., NE Section 9, Busseron Township.

Laporte County—No. 1 John Siddles, drilled by H. J. Hauck and others in Section 4, Lincoln Township, is down 55 feet in the Trenton.

Orange County—C. W. Reichard is drilling the Fred A. Cleveland test in Section 30, Orangeville Township.

Perry County—H. C. Darby's test on the U. S. Cummings farm in Section 8, Tobin Township, was reported dry after reaching the Corniferous. No. 1 Margaret Taylor has been started by Bolyard and others, SW Section 19, Anderson Township.

Pike County—Ohio Oil Co. abandoned No. 2 J. O. Sutton, SW Section 30, Madison Township. In Section 20, Washington Township, Harry N. Bell completed a third well on the R. M. Craig heirs farm, with 1,000,000 feet at 1,103-17 feet. A 1,400,000-foot gas well was completed by C. C. Talliaferro at 1,086-1,101 feet in No. 6 Aaron George, Section 20, same township. A. V. Burden plugged No. 1 Walter Smith, NW Section 19, Washington Township. Perry Andrews is drilling on the Loveless lease in the Oatsville Pool.

Spencer County—Medley Brothers are drilling No. 1 J. Phillips, in Huff Township, to the Mississippi lime. No. 1 Gus Sauter, NW Section 3, Huff Township, after being shut down for several months, is also being drilled into the lime.

Sullivan County—William H. Wood is drilling on the Dolphia Sludder lease, NW Section 20, Curry Township.

Switzerland County—No new completions were reported from the Clark Township area, where wells were drilling on the James Hankins, M. H. Griffith, and Lawrence Cooper farms.

Warrick County—No. 1 Henry Menke, drilled by the Elberfeld Gas & Oil Co. in NW Section 36, Greer Township, has been shut down at 1,776 feet with a good oil showing reported at 1,683 feet.

KENTUCKY

In the western part of Kentucky, in the Owensboro area, but one well was reported completed, Hupp, French and others' test on the Asa Bratcher farm, in the Cane Run Pool, of Daviess County, which produced only 5 bbls. initial from the Stray sand at a total depth of 556 feet.

The bringing in a week ago by Mida McMahon of No. 2 on the Robert Jones farm, in the Jones Pool of Daviess County, which had an initial production of 175 bbls., makes that area one of the choice spots in the western area of the state, and is bound to bring about additional drilling.

An unusual strike was made by T. A. Heckerthorn, drilling for Archie McGuire and others along State Highway No. 90, between the Cincinnati arch and Burkesville Hill, in Cumberland County, by bringing in a gas well estimated as good for 2,000,000 feet, found just before encountering the upper Sunnybrook sand. This also had an oil showing. Cumberland County is said to be the oldest oil field in the world and it is predicted there will be some surprising strikes in that county during the present year. Other counties in the central portion of the state that no doubt will be given tests are: Hardin, Larue, Marion, Taylor, Meade, Grayson, Green, Adair, Metcalf, Oldham, Carroll, Gallatin and counties along the Ohio River.

LOWER ROAD COSTS URGED

If road costs were lowered an increase in the New York State gasoline tax would be unnecessary, says O. B. Augspurger, president of the New York Automobile Club. A restriction of heavier trucks to certain heavily constructed arterial highways would mean a saving of approximately $20,000 per mile on the construction of roads for passenger cars and light trucks, Mr. Augspurger pointed out.

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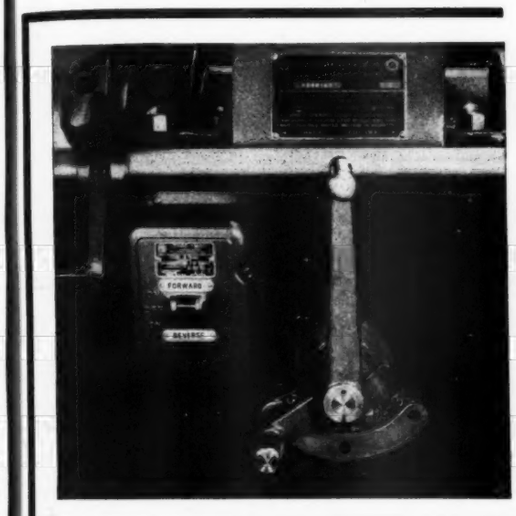

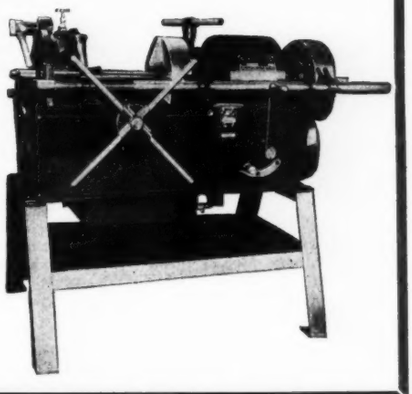

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VALVES—PIPE FITTINGS—FIRE HYDRANTS

MICHIGAN FIELDS

(Continued from Page 46)

which the initial well proved a real gusher, and is drilling No. 2 George Lilly, S half NE Section 18, and No. 3 W. E. Harrison farm, Section 18, same township. Columbia Oil & Gas Co. is drilling No. 5 in the northwest corner of the George Hornick farm, NW NW SE Section 15. Talbot Oil Co. is drilling No. 1 on the southwest corner of the State of Michigan land, SW SW SE Section 11, same township. Walter L. McClanahan is drilling No. 4 well, 990 feet from the north line and 330 feet from the west line of the A. G. Struble farm, SW NE SW Section 10, same township; also No. 1 in the northwest corner of the W. S. Root farm, NW NW SW Section 12, and has made a location for No. 1 on the A. E. Hughes, NE NE Section 20. McClanahan has also made location for No. 2 in the northwest corner of the Henry Morrison, NW SW SE Section 10.

Edward B. Strom is drilling in the northwest corner of the D. A. and Maud Newland farm, SW NE Section 19, Midland Township, Midland County.

Mellon-Pollock Oil Co. and others are drilling No. 3 in the southeast corner of the John Brief farm, N half SW Section 22, Vernon Township, Isabella County.

Present daily production of some of the noted wells of the Mount Pleasant Field are: No. 1 Bernard farm, 1,100 bbls. daily; Struble farm wells, 1,650 bbls.; Morrison farm No. 1 well, 1,800 bbls.; No. 1 Iosco, 652 bbls.; No. 1 Mullett well, 725 bbls.; No. 1 Purtell well, 1,713 bbls., and No. 2 Purtell, 777 bbls.

In Clare County, James McKay is drilling No. 9 well, 450 feet from the south line and 1,000 feet from the east line of the James McKay farm, SW SE NE Section 6, Grant Township.

ROCKY MOUNTAIN AREA

(Continued from Page 43)

den, SE cor., Section 24-4s-69, near Denver, is resuming at 4,106 feet after a shutdown to overhaul and repair the rig. The 6⅝-inch was cemented at 3,950 feet and drilling out plug is in progress.

Larimer County

Charles A. Culter and others' No. 1, SE, Section 4-4n-70, West Berthoud district, has spudded in for a shallow test with Keystone rig. This group has blocked considerable acreage between Berthoud and Loveland and it is reported plans call for two deep tests with standard equipment in addition to the well now spudding.

Consolidated Drilling Co.'s No. 1-A Maxwell, SE NE NE, Section 25-8n-70, Bellvue district, is preparing to resume at 285 feet.

Mayer Oil Co.'s No. 1 Reed, SW cor. NW, Section 28-4n-69, Berthoud district, is bottomed at 3,100 feet and underreaming the 6⅝-inch at 2,500 feet.

Moffat County

Ohio Oil Co.'s No. 1 Bogenschultz, C SE SE, Section 9-6n-91, Craig Dome, was reported in a telephone message from Craig to have blown in this morning at 2,781 feet and to be making a large quantity of gas. It was impossible to estimate the flow, according to report, as water from an upper sand was going 15 feet over the top. The gas was found at approximately the depth it was expected. The objective is a sand in the Basal Mesa Verde in which the Midwest Refining Co. had a large flow of gas on the Bell Rock Dome. The 8¼-inch will be run and cemented to shut off the water and make a test.

Archuleta County

Oil City Petroleum Co.'s No. 1 Fitzhugh, NW SE SW, Section 34-33n-1e, Chromo Dome, which topped the Lakota sand at 670 feet with a good show of gas, has been marooned by a severe blizzard and no word has been received as to whether the casing was run and a test made. Trains were stalled for 10 days and telephone communication was cut off.

Rio Blanco County

California Co.'s No. 1 California-Raven, NW SE, Section 30-2n-102, Rangely Dome, is waiting after cementing the 13⅜-inch at 3,575 feet. The size and depth of the string is of considerable interest. It consists of 72-pound pipe and was cemented with 1,450 sacks. It is understood this well, which is a deep test to the Weber sandstone in the Pennsylvania, is running a little higher than the other wels drilled on the structure. It topped the Dakota at 2,940 feet, but the hole was full of heavy mud and the quantity of gas in that horizon was not determined.

WYOMING

Secretary Wilbur has signed the unit operation agreement covering the Big Sand Draw gas field in Fremont County, but details are not available here. About a year ago the owners of gas rights in sands in the Frontier formation, with the exception of the United States, signed a preliminary agreement, to be followed by a supplemental contract which provides for the details of operation. The preliminary agreement comprised all acreage which comes within the 2,800-foot contour, based on the first sand of the Frontier series, and amounted to 2,520 acres. It is understood 1,960 acres were included in the unit plan. The Producers & Refiners Corp. will be the operating organization. The agreement applies only to the gas in the sands of the Frontier and any deposits of gas in other formations and oil in any, or all of the sands are specifically excluded. The working interests as merged at the time gave the Producers & Refiners a 91.3 interest, the other being divided between Riverton Petroleum Co., Reiter-Foster Oil Corp., MacKinnie Oil & Drilling Co. and several individuals. Of the total acreage 1,720 acres is government land. The reserves are estimated at 200,000,000,000 feet. Gas is being supplied to communities in Fremont County, to Casper, Glenrock and other towns reached by the North Central Gas Co.'s pipe line into western Nebraska.

Park County

Midwest Refining Co.'s No. 4 Rosenberg, NE NW NE, Section 26-58-98, Frannie Dome, is bottomed at 3,234 feet in the Embar and is preparing to core. The Embar was topped at 3,225 feet. This well will extend the proven area one-third of a mile to the northwest if it comes in a producer.

Natrona County

Midwest Refining Co.'s No. 11, SE NW NW, Section 32-34-77, Geary Dome, is being abandoned at a total depth of 6,210 feet. The Muddy at 6,092-6,105 feet was dry. The Dakota at 6,155-75 feet, made 5,500 bbls. per day of water. The Lakota at 6,188-6,210 feet produced 5,000 bbls. of water testing 142° F.

MONTANA

Carbon County

Ohio Oil Co.'s No. 1 Kuchinski, NW SE NE, Section 15-7s-22, Golden Dome, is drilling at 1,895 feet. Same company's No. 2 Robinson, C SE SE, Section 3-7s-21, Dry Creek, is building steel derrick, and its No. 2 Montana Industrial, C NW SE, Section 11-7s-21, is drilling at 1,185 feet.

Carbon Oil & Gas Co.'s No. 1 McMinn, NW SW SW, Section 7-7s-22, Dry Creek, cemented 12½-inch at 400 feet and is ready to resume with rotary.

Liberty County

California Co.'s No. 1 Ross, NE SE NE, Section 3-33-6e, Utopia district, is drilling at 2,608 feet and carrying the 10-inch to land below the second water sand.

Northland Oil & Gas Co.'s No. 1 Yurman, C SE SW, Section 32-33-5e, Liberty district, is drilling at 3,790 feet after cementing cave.

Golden Valley County

Golden Valley Oil Co.'s No. 1, SW SE, Section 26-6n-22, Belmont district, is drilling at 2,865 feet after cementing cave at 2,850 feet.

Fallon County

McDonald and others' No. 3, C SW, Section 28-8n-60, Cedar Creek, landed the 8¼-inch at 1,682 feet and is cleaning out.

Glacier County

Fulton Petroleum Co.'s No. 1 Blackfeet, SW NE NE, Section 28-36-12w, Milk River district, is shut down at 2,880 feet after straightening crooked hole.

Musselshell County

Laffea Oil Co.'s No. 2, NE NW SE, Section 6-10n-25, Devil's Basin, is drilling at 980 feet. Objective is expected at 1,100 feet.

UTAH

Utah Southern Oil Co.'s No. 1 Balsey, C NE NE, Section 31-23-21, Grand County, is standing cemented at 5,200 feet preliminary to sidetracking bit.

Diamond Oil Co.'s No. 1, SE NW, Section 16-8s-8e, Utah County, is drilling at 3,475 feet.

WASHINGTON

H. L. Williams, writing from Seattle, McKinley County, Washington, says his well in Section 19-19-8, McKinley County, has not been abandoned and that he expects drilling to be resumed soon. It had been reported from the field as an abandoned well, after a long shutdown.

Pipe Line Runs

Average daily pipe line runs for the week ended February 20:

WYOMING

	Bbls.
Salt Creek	22,520
Badger Basin	50
Big Muddy	1,650
Byron-Garland	1,320
Greybull	10
Dallas-Derby	130
Elk Basin	550
Ferris	20
Frannie	30
Grass Creek	2,070
Hamilton Dome	780
Hudson	440
LaBarge	950
Lance Creek	110
Lost Soldier	2,220
Osage	950
Pilot Butte	40
Rock River	1,700
Poison Spider	260
Teapot	20
Total Wyoming	35,850

MONTANA

Buckley-Border	640
Cat Creek	920
Dry Creek	300
Kevin-Sunburst	4,090
Lake Basin	70
Pondera	1,220
Total Montana	7,240

COLORADO

Florence	340
Fort Collins	900
Iles	750
Moffat	780
Orchard	440
Rangely	20
Tow Creek	310
Total Colorado	3,540

NEW MEXICO

Rattlesnake	700
Hogback	220
Table Mesa	75
Artesia	470
Cap Rock	600
Hobbs	31,396
Jal	906
Lea City	2,135
Eunice	362
Texas Pacific	145
Total New Mexico	37,009
Total Rocky Mountain area	83,639
Total previous week	80,906
Difference	2,733

KINLEY CONQUERS FIRE IN RUMANIAN OIL FIELD

In a cablegram to his wife, M. M. Kinley, of Tulsa, advised he was sailing from Cherbourg, France, on February 20 for the United States after an absence of about eight months in Rumania bringing a gas well there under control.

This fire started in May, 1929, and burned for 18 months before Mr. Kinley shot it out. Following the extinguishing of the gas fire other troubles developed and it has been necessary to do a great deal of work at the property to bring the gas finally under control and make things safe.

It has been a very difficult well to handle and while details of methods used to subdue it finally are not at hand it is assumed that it has been finally repaired to the satisfaction of the owners and the Rumanian government as engineers for both parties were interested in the work.

Mr. Kinley should be in Tulsa again in two or three weeks. He is the senior member of the fire fighting firm of Kinley Brothers, his younger brother Floyd, being the other member.

OKLAHOMA FIELDS

(Continued from Page 33)

Sovereign Oil Corp. for its No. 1 in the C NE NE SE, Section 3-12-5, and the owners plan to move in the tools at once.

Seminole Production

The production from the Greater Seminole area for the week ending February 19, was approximately 149,675 bbls. a day. The Seminole Field, which includes the first 12 pools listed below, averaged 110,380 bbls:

Pool—	Bbls.
Little River	18,320
East Little River	2,390
Carr City	17,065
Maud	2,105
Mission	8,435
Bowlegs	12,905
Earlsboro	14,065
South Earlsboro	4,245
East Earlsboro	14,655
Seminole	11,165
East Seminole	1,225
Searight	3,805
Total	110,380
Allen	9,275
Asher	540
Wanette	3,245
Konawa	6,790
Sasakwa	1,835
St. Louis-Pearson	18,610
Total	149,675

Oklahoma City Production

The daily average production of the Oklahoma City Field for the week ending February 20, and the number of wells produced each day was as follows:

Date—	Bbls.	Wells
February 14	57,995	109
February 15	36,705	95
February 16	36,830	95
February 17	96,998	133
February 18	99,370	140
February 19	104,331	134
February 20	114,725	151

Comanche County

Crane & Aiken's No. 1 Adkins, NE cor. SE Section 14-1-9w, has been abandoned at 3,265 feet.

Creek County

Gled Oil Co.'s No. 1-A L. Thomas, SE cor. NE Section 8-19-9, is drilling at 600 feet. M. S. Hughes and others made location for No. 2 Flinchum, SE cor. SW SW Section 11-19-9. Johnson Oil Refining Co.'s No. 1 Johnson, NW cor. SE NE Section 29-19-9, has been completed for 1,250,000 feet of gas in Skinner sand at 2,062-87 feet after plugging back from 2,325 feet in Bartlesville sand. Curtis Oil Co.'s No. 1 Barnett, SW cor. SE SE Section 18-17-10, made 7,000,000 feet of gas in Red Fork sand 2,166-71 feet. J. H. Wright Estate's No. 2-A Cartwright, SW cor. NE SW Section 19-17-11, has been completed for 10 bbls. in sand at 2,418-37 feet. E. Shamblin and others' No. 1 Wilson, SE cor. NE NE Section 21-15-8, made 1,750,000 feet of gas from sand at 1,154-60 feet.

Custer County

Miley Petroleum Co.'s No. 1 Caldwell, NE cor. Section 12-14-14w, is a slush pit.

Greer County

Roy Good and D. M. Dowell's No. 1 Cliffell, NW cor. Section 1-7-22w, has been completed for 5,000,000 feet of gas in sand at 1,462-65 feet.

Hughes County

Felenee and others made location for No. 1 Whitley, NW cor. SE NE, Section 14-7-8. Producers & Refiners Corp.'s No. 1 Narcomay, NW cor. SE SW, Section 9-7-8, has been completed for 5,200,000 feet of gas in sand 2,915-83 feet.

Marshall County

T. A. Stanett moved a machine in for No. 1 Henry, NE cor. SW Section 22-7s-6. Porter Newman and others made location for No. 1 Henry, NW cor. Section 22-7s-6. C. Davis and others moved a machine in for No. 1 Minters, NW cor. SW NW SW Section 30-7s-6.

Muskogee County

J. V. Dunbar's No. 2 E. Spaulding, SW cor. NE SW Section 4-15-18, is a machine. Armstrong and others' No. 9 S. Morrison, C SW SW Section 15-14-16, is rigging up to deepen. J. V. Dunbar's No. 1 P. McIntosh, SW cor. NE SE Section 4-15-18, has been abandoned at 1,138 feet.

Oklahoma County

Phillips Petroleum Co. and others' No. 2 Everest, Block 20, Lot 22, Fruitland

addition to the city of Oklahoma City, NW cor. SE NW SE Section 15-11-3w, is a cellar. Denver Producing & Refining Co. moved the rig in for No. 1 Johnson, Block 7, Lot 10, Carney Heights addition, NE cor. SW NW NE Section 22-11-3w. C. F. Cuniff, trustee's No. 1 St. Joseph Orphanage, SW cor. NE SW SE Section 17-12-4w, has been abandoned at 6,700 feet. Phillips Petroleum Co.'s No. 2 Ashcan, NE cor. NW NE NE Section 3-11-3w, has been completed for 16,402 bbls. in eight hours on a 5-inch choke from sand at 6,470 feet, total depth. Westgate Oil Co.'s No. 1 Blevins, NE cor. SW SW NW Section 10-11-3w, topped Wilcox sand at 6,422 feet, drilled to total depth of 6,538 feet and flowed 2,985 bbls. in four hours. Phillips Petroleum Co. and Sutton's No. 1 Classen, SW cor. SE SE NW Section 15-11-3w, made 3,988 bbls. in three and one-half hours on a 4-inch choke, producing from total depth of 6,550 feet. Phillips Petroleum Co. and others' No. 1 Everest, NW cor. SW NW SE Section 15-11-3w, has been completed at 6,540 feet, making 4,809 bbls. in four hours on a 4-inch choke.

Okmulgee County

F. E. Cusack's No. 5 L. Doyle, NE cor. SE SW Section 15-13-14, is rigging up.

Osage County

J. E. Cooper and others moved a machine in for No. 2, NE cor. SW SE Section 26-21-10.

Pittsburg County

Utilities Production Co.'s No. 1 Church lot, NE cor. NW NE Section 16-7-18, has been completed for 6,500,000 feet of gas in sand at 1,782-2,060 feet.

Pottawatomie County

Barnsdall Oil Co. and others' No. 1 Gray, NE cor. SW Section 25-6-4, is a rig under construction. Mid-Continent Petroleum Corp.'s No. 1 Farmer, SE cor. SW NW Section 2-6-4, is dry and abandoned at 4,431 feet.

Seminole County

Barnes & Taylor's No. 1 Bruner, SW cor. SE SW Section 29-10-6, is a cellar. Pure Oil Co.'s No. 2 Tiger, SE cor. NE SW Section 3-8-5, Carr City Pool, has been completed for 920 bbls. from Wilcox sand at 4,155-63 feet and 40 bbls. from Hunton lime at 3,915-60 feet.

Stephens County

Pace and others' No. 2 Green, SE cor. SW NE Section 2-2s-8w, is a rig. J. C. Chambers and others' No. 1 Dare, NW cor. SE SE Section 2-2s-8w, is rigging up rotary tools. Continental Oil Co.'s No. 2 Dare, NW cor. SW SE Section 2-2s-8w, is drilling at 50 feet. Ed Chamberlin has the rig up for No. 1 Parker, NE cor. SE SE Section 11-2s-8w. Brown and others' No. 1 Thompson, NE cor. SE SW Section 35-1s8w, has been abandoned at 2,250 feet.

Tulsa County

O. K. Detrick and others made location for No. 1 H. Bear, NW cor. NE SE Section 29-16-13. Holmes Drilling Co.'s No. 1 Cook, CNL NE SW Section 7-19-10, has been abandoned at 1,322 feet. O. K. Detrick and others' No. 1-A Stanley, NE cor. NW SE Section 29-16-13, made 7,000,000 feet of gas in sand at 1,758-62 feet.

Wagoner County

J. E. Martin and others' No. 1 Drew, SW cor. NE Section 26-18-15, is rigging up. R. A. Godfrey's No. 1 Kernal, NE cor. SW NE Section 7-15-17, has been abandoned at 1,147 feet.

SKID STATION AND TANK

HOUSTON, Tex., Feb. 22.—With a team of mules and a winch as the only motive power, the buildings and a 12,000-bbl. tank of an abandoned pumping station on the West Columbia-Humble pipe line of the Texas Pipe Line Co. were moved intact a distance of 3 miles to the site of a new pumping station which is being installed near The Texas Company's Manvel discovery well completed several months ago.

The buildings and tank were moved by dragging them on skids and rollers. The country about Manvel is a flat prairie which made the skidding possible. The work was under the personal direction of C. O. Crouch, division superintendent.

EAST TEXAS FIELDS

(Continued from Page 26)

the previous week. Companies are now connecting to those wells which are reported, and for which connections are requested, but high water continues to interrupt field work, and slow up connection work, and some of the producers will suffer on that account.

Clifford Oil Co.'s No. 1 Haake in the J. Hanks Survey, east of Grand Saline in Van Zandt County, is now shut down to cement casing at 2,800 feet, after encountering a showing of oil and gas. This well has been in the process of drilling for about a year, and little attention has been directed to it heretofore. Drilling will be resumed after the casing is set.

Van Field

Pure Oil Co.'s No. 1 V. T. Davis in the north end of the Van Field is still shut down waiting for cement to set. Total depth is 6,795 feet. It is in the lower Trinity series and is considered as having but few chances for making a producer in the Trinity sand. It will be drilled to 8,000 feet, and although it may not make a producer will furnish valuable information to the company's geological department, and for the East Central Texas district.

The company's No. 1 D. F. Cade in the Nacogdoches County School Lands was drilled to test the shallow Nacatoch sand in the northwestern part of the field, in an effort to make a commercial producer out of the well from this sand, and prove up more acreage for the company and for the field, validating several leases in the area. It failed to make a producer from the Nacatoch so is being drilled deeper for geological information. It is also too low to make a producer from the Woodbine sand.

There are two wells in the northern part of the field which have gone dead after pumping for a long time. Fourteen other wells are on the pump in the field.

Falls County

The Dixie Oil Syndicate, Inc. is to start another test in the newly discovered oil area in the northern part of Falls County at once. This test is to be 1,000 feet northwest of the company's No. 2 well which is the first producer in the county estimated good for 200 bbls. per day. Another test is to be drilled about the same distance to the northeast of the discovery well, and lease has been taken on the river bed, approximately 1,400 feet east of the well, and a test may be put down in the river bed in the near future.

Mexia Fault Line Fields

Companies which have produced oil in the Mexia fault fields for several years are now selling their wells and equipment on the leases to salvage companies which are plugging the wells and moving off the equipment, much of which has gone to the East Texas district. Price of equipment on these old wells is around $6,000. Lifting costs run from 70 to 90 cents per barrel, due to the large amount of salt water, and small amount of oil, consequently the companies have found it impracticable to produce the wells at such costs, therefore have sold them.

The Mexia Field is producing around 2,795 bbls. per day, the Powell Pool 2,465 bbls., Wortham 200 bbls., Currie 210 bbls., and Richland 35 bbls. Nigger Creek's 31 wells have been abandoned and Cedar Creek's seven wells have also been abandoned. These two fields are located west of Mexia.

There were 507 wells abandoned in the fault line fields during 1931, leaving a total of 656 producing wells in the district. The East Texas district produced more in 15 months' time than the fault line fields have in 10 years.

The past year has been the first since 1918 in which no test was drilled on the fault line.

COMPLETIONS IN EAST TEXAS

Gregg County

Alma Petroleum Co.'s No. 2 C. D. Cox, top sand 3,659 feet, initial production 30 bbls. in 15 minutes through three-fourths inch tubing choke, total depth 3,686 feet. Amerada Petroleum Corp.'s No. 3 Killingsworth, top sand 3,568 feet, initial production 75 bbls. in 30 minutes through 1-inch tubing choke, total depth 3,595 feet; No. 5 J. M. Tuttle, top sand 3,531 feet, initial production 77 bbls. in 30 minutes through 1-inch tubing choke, total depth 3,560 feet. Arkansas Fuel Oil Co.'s No. 2-B M. B. McPherson, top sand 3,490 feet, initial production 49 bbls. in 15 minutes through open tubing, total depth 3,493 feet. Bunn and others' No. 1 E. B. Everett, location abandoned. Cal-Pet Corp.'s No. 2 J. M. Tuttle, top sand 3,512 feet, initial production 150 bbls. per hour through three-fourths inch tubing choke, total depth 3,538 feet. Gene Campbell and others' No. 1 E. Anderson, location abandoned.

Cox and Hamon's No. 5 Lacy, top sand 3,510 feet, initial production 35 bbls. in 15 minutes through open tubing, total depth 3,600 feet. Cox and Huffman's No. 1 Johnson, top sand 3,605 feet, initial production 40 bbls. in 15 minutes through three-fourths inch tubing choke, total depth 3,637 feet. Darby Petroleum Co.'s No. 2 Clemmens, top sand 3,603 feet, initial production 30 bbls. per hour through open tubing, total depth 3,623 feet; No. 3 Richey, top sand 3,518 feet, initial production 35 bbls. per hour through one-half inch tubing choke, total depth 3,550 feet. Gilcrease Oil Co.'s No. 3 A. Christian, top sand 3,595 feet, initial production 85 bbls. per hour through tubing choke, total depth 3,620 feet. Shilce Oil Co.'s No. 1 White Oak School, top sand 3,600 feet, initial production 90 bbls. per hour through 1-inch tubing choke, total depth 3,625 feet. Heiden and Woodard's No. 1 T. C. Tyra, location abandoned. Kilgore-Barton and Hanson's No. 1-B L. M. Colburn, top sand 3,577 feet, initial production 18 bbls. in 10 minutes through eleven-sixteenths inch tubing choke, total depth 3,602 feet.

Leckner and Hubbard's No. 1 L. Y. and J. A. Tuttle, top sand 3,520 feet, initial production 30 bbls. per hour through one-half inch tubing choke, total depth 3,552 feet; No. 2 J. M. Tuttle, top sand 3,520 feet, initial production 30 bbls. in one-half hour through 1-inch tubing choke, total depth 3,554 feet. London Petroleum Corp.'s No. 1 I. J. Sturvinant, top sand 3,618 feet, initial production 30 bbls. in one-half hour through 1-inch tubing choke, total depth 3,621 feet. Lucy Petroleum Co.'s No. 2 McHeney Lobe, top sand 3,550 feet, initial production 155 bbls. per hour through 1-inch tubing choke, total depth 3,578 feet. J. D. Stock and Lyon Oil & Gas Co.'s No. 2 J. S. Doby, top sand 3,487 feet, initial production 90 bbls. per hour through 1-inch tubing choke, total depth 3,519 feet.

Magnolia Petroleum Co.'s No. 2 F. M. Fonville, top sand 3,565 feet, initial production 242 bbls. per hour through open tubing, total depth 3,581 feet; No. 4 Tuttle, top sand 3,575 feet, initial production 150 bbls. per hour through 1-inch tubing choke, total depth 3,595 feet. J. H. Massey's No. 3 M. Finn, top sand 3,588 feet, initial production 120 bbls. per hour through 1-inch tubing choke, total depth 3,625 feet. Perkins and others' No. 1 McGrede, top sand 3,623 feet, initial production 95 bbls. per hour through eleven-sixteenths inch tubing choke, total depth 3,653 feet. Petroleum Purchasing Co.'s No. 2 Sheppard, top sand 3,560 feet, initial production 75 bbls. in 30 minutes through 1-inch tubing choke, total depth 3,595 feet. Pilot Oil Co.'s No. 1 J. C. Bumpass, top sand 3,509 feet, initial production 75 bbls. in 20 minutes through open tubing, total depth 3,529 feet.

Red Star Oil Co.'s No. 3 M. Lemaire, top sand 3,587 feet, initial production 104 bbls. in 50 minutes through three-fourths inch tubing choke, total depth 3,591 feet. Shell Petroleum Corp.'s No. 3 J. H. Slaton, top sand 3,590 feet, initial production 27 bbls. in one-half hour through 1-inch tubing choke, total depth 3,672 feet; No. 4 Slaton, top sand 3,580 feet, initial production 30 bbls in 30 minutes through tapered tubing, total depth 3,650 feet. Smith and Merriwinkle's No. 4 Bauknight, top sand 3,590 feet, initial production 75 bbls. per hour through 1-inch tubing choke, total depth 3,611 feet. Stanolind and Simms Oil Co.'s No. 2 J. H. Boles, top sand 3,531 feet, initial production 75 bbls. in 30 minutes through three-fourths inch tubing choke, total depth 3,598 feet. Stanolind and others' No. 2 H. Key, top sand 3,525 feet, initial production 47 bbls. in 15 minutes through open tubing, total depth 3,614 feet. Sun Oil Co.'s No. 6 J. W. Aikin, top sand 3,501 feet, initial production 120 bbls. per hour through 1-inch tubing choke, total depth 3,536 feet; No. 7 Satterwhite, top sand 3,568 feet, initial production 94 bbls. per hour through open tubing, total depth 3,602 feet.

Yount Lee Oil Co.'s No. 4 L. E. Orms, top sand 3,506 feet, initial production 95 bbls. per hour through eleven-sixteenths inch tubing choke, total depth 3,526 feet; No. 2 E. N. Wadley, top sand 3,475 feet, initial production 84 bbls. per hour through eleven-sixteenths inch tubing choke, total depth 3,495 feet. E & F Petroleum Corp.'s No. 1 M. S. Jackson, top sand 3,675 feet, initial production 100 bbls. per hour through 1-inch tubing choke, total depth 3,687 feet. Arkansas Fuel Oil Co.'s No. 1 G. Donaldson, top sand 3,578 feet, initial production 125 bbls. per hour through three-fourths inch tubing choke, total depth 3,607 feet. B. Y. Carroll's No. 1 J. M. Dickson, location abandoned. Central Com. Oil Co.'s No. 1 A. A. King, top sand 3,709 feet, initial production 60 bbls. per hour through open 2-inch tubing, total depth 3,712 feet.

Gulf Production Co.'s No. 6 A. C. Alexander, top sand 3,535 feet, initial production 100 bbls. per hour through three-fourths inch tubing choke, total depth 3,555 feet; No. 5 G. Culver, top sand 3,528 feet, initial production 52 bbls. per hour through three-fourths inch tubing choke, total depth 3,563 feet. Houston Oil Co.'s No. 2 J. S. Elder, top sand 3,532 feet, initial production 25 bbls. in 15 minutes, total depth 3,360 feet. Houston and Heep Oil Co.'s No. 2-A Huey, top sand 3,448 feet, initial production 42 bbls. in 15 minutes through 1-inch tubing choke, total depth 3,488 feet.

Sells Petroleum Co.'s No. 1 Williams, top sand 3,561 feet, initial production 20 bbls. per hour through three-fourths inch tubing and 2½-inch tubing choke, total depth 3,579 feet. Louisiana Oil & Refining Co.'s No. 2 W. C. Griffin, top sand 3,563 feet, initial production 115 bbls. per hour through three-fourths inch tubing choke, total depth 3,588 feet. Perkins and Hinds' No. 1 Bean, top sand 3,564 feet, initial production 75 bbls. per day pinched, total depth 3,607 feet. Magnolia Petroleum Co.'s No. 4 A. Hicks, top sand 3,693 feet, initial production 154 bbls. per hour through 1-inch tubing choke, total depth 3,697 feet; No. 7 Ben Laird, top sand 3,582 feet, initial production 57 bbls. in 5 minutes through 3-inch tubing choke on line and 1-inch tubing, total depth 3,591 feet. Harry Moss' No. 3 Marshall, top sand 3,530 feet, initial production 20 bbls. in 15 minutes through three-fourths inch tubing choke, total depth 3,575 feet. Pilot Oil Co.'s No. 3 Johnson, top sand 3,527 feet, initial production 75 bbls. per day pinched, total depth 3,565 feet.

Sneed and others' No. 1 Griffin Davis, top sand 3,609 feet, initial production 35 bbls. in 15 minutes through three-fourths inch tubing choke, total depth 3,621 feet. Stanolind Oil & Gas Co.'s No. 1 A. A. Lochart, top sand 3,615 feet, initial production 20 bbls. in 10 minutes through 1½-inch tubing choke, total depth 3,620 feet. Tidal Oil Co.'s No. 5 M. C. Barton, top sand 3,596 feet, initial production 208 bbls. per hour through open tubing on 5-minute test, total depth 3,620 feet. Wheelock and Collins' No. 2 Clayton heirs, top sand 3,500 feet, initial production 110 bbls. per hour through three-fourths inch tubing choke, total depth 3,518 feet.

Henderson County

Alma Petroleum Co.'s No. 1 T. B. Wooford, dry and abandoned, total depth 4,846 feet.

Houston County

Winfree and others' No. 1 Hodges, dry and abandoned, total depth 2,300 feet.

Leon County

Cooper and others' No. 1 Lynch, dry and abandoned, total depth 1,931 feet.

Nacogdoches County

Bunte, trustee's No. 1 A. F. Boatman, dry and abandoned, total depth 1,605

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feet. G. A. Teague's No. 1 Matthews, dry and abandoned, total depth 110 feet.

Rusk County

Everts Drilling Co.'s No. 1 Beasley, top sand 3,853 feet, initial production 75 bbls. per day pinched, total depth 3,854 feet. Gulf Production Co.'s No. 6 Florence, top sand 3,723 feet, initial production 95 bbls. per hour through three-quarters-inch tubing choke, total depth 3,730 feet. Humble Oil & Refining Co.'s No. 3 M. Robertson, top sand 3,636 feet, initial production 43 bbls. in one-half hour through three-quarters-inch tubing choke, total depth 3,701 feet. Kirby Petroleum Co.'s No. 2 Rettic, top sand 3,651 feet, initial production 140 bbls. in 45 minutes through open tubing, total depth 3,745 feet.

Lewis Production Co. and Shelby Oil & Gas Co.'s No. 3 F. C. Peques, top sand 3,581 feet, initial production 75 bbls. per day pinched, total depth 3,655 feet.

Shell Petroleum Corp.'s No. 7 W. P. Moore, top sand 3,691 feet, initial production 16 bbls. in one-half hour through tapered tubing, total depth 3,697 feet. Stroube and Black's No. 2 Jernigan, top sand 3,694 feet, initial production 75 bbls. per day pinched, total depth 3,742 feet. Tidal Oil Co.'s No. 4 Jack Bena, top sand 3,546 feet, initial production 126 bbls. per hour through 2-inch tubing choke, total depth 3,580 feet. Arrow Drilling Co.'s No. 2 L. B. Rollins, top sand 3,650 feet, initial production 195 bbls. per hour through 2½-inch tubing choke on 2-inch lead line, total depth 3,660 feet.

Aston Oil Co.'s No. 3 J. R. Alford, top sand 3,612 feet, initial production 160 bbls. per hour through 2-inch tubing choke, total depth 3,680 feet. Big Indian Oil Co.'s No. 2 Deason, top sand 3,660 feet, initial production 155 bbls. per hour through open casing, total depth 3,731 feet. S. Brackman's No. 1 W. O. Alford, top sand 3,785 feet, initial production 90 bbls. in 40 minutes through open tubing, total depth 3,791 feet. Coombs' No. 5 Stone, top sand 3,704 feet, initial production 180 bbls. per hour through open tubing, total depth 3,710 feet. Gulf Production Co.'s No. 3 S. B. Stone, top sand 3,764 feet, initial production 65 bbls. per hour through three-quarters-inch tubing choke, total depth 3,770 feet. Humble Oil & Refining Co.'s No. 1 E. W. Naulls, top sand 3,600 feet, initial production 54 bbls. per hour through three-quarters-inch tubing choke, total depth 3,718 feet; No. 2 F. F. Wooster, top sand 3,755 feet, initial production 76 bbls. per hour through three-quarters-inch tubing choke, total depth 3,803 feet. M. H. McMurray's No. 1-A Blackwell, top sand 3,650 feet, initial production 60 bbls. in 20 minutes through open tubing, total depth 3,670 feet. Jim McMurray's No. 1 Fair, top sand 3,630 feet, initial production 372 bbls. per hour through open casing and tubing, total depth 3,652 feet.

Mid-Kansas Oil & Gas Co.'s No. 1 Grissom, top sand 3,607 feet, initial production 175 bbls. per hour through open tubing, total depth 3,614 feet; No. 3 J. F. Mason, top sand 3,643 feet, initial production 190 bbls. per hour through open tubing, total depth 3,687 feet; No. 10 R. E. Moores, top sand 3,616 feet, initial production 125 bbls. per hour through three-quarters-inch tubing choke, total depth 3,679 feet. Albert Nathan's No. 1 Deason, top sand 3,662 feet, initial production 40 bbls. per hour through three-quarters-inch tubing choke, total depth 3,737 feet. Olsen Brothers' No. 3 J. S. Power, top sand 3,676 feet, initial production 245 bbls. per hour through open tubing, total depth 3,681 feet. Ortiz Oil Co.'s No. 2 H. M. Hale, top sand 3,617 feet, hole junked and abandoned, total depth 3,727 feet.

Phillips and others' No. 1 L. J. Pinkston, junked and abandoned, total depth 3,080 feet. Pilot Oil Co.'s No. 3 M. A. Thrash, top sand 3,718 feet, initial production 189 bbls. in 45 minutes through 1½-inch tubing choke, total depth 3,735 feet. R. M. V. Oil Co.'s No. 6 J. A. Birdwell, top sand 3,654 feet, initial production 165 bbls. per hour through open tubing, total depth 3,665 feet. Stanolind Oil & Gas Co.'s No. 3-B Schuler, top sand 3,644 feet, initial production 75 bbls. in 1 hour and 15 minutes through open tubing, total depth 3,690 feet. Stanolind and Pure Oil Co.'s No. 1 Rass Lacy, top sand 3,604 feet, initial production 22,000,000 feet of gas open on 4-inch line off 7-inch casing, total depth 3,666 feet. C. H. Tautenhahn and others' No. 1 Camp, top sand 3,525 feet, initial production no gauge, total depth 3,636 feet.

The Texas Company's No. 1 W. W. Henry, top sand 3,612 feet, initial production 106 bbls. per hour through three-fourths inch tubing choke, total depth 3,620 feet. Thompson and others' No. 1 Alford, top sand 3,584 feet, initial production 65 bbls. in five hours through open tubing by heads, total depth 3,692 feet. Welch and others' No. 1 Camp, top sand 3,581 feet, initial production 275 bbls. per day pumping, total depth 3,650 feet.

Upshur County

Callahan and others' No. 1 Honeycut, location abandoned. Gillett-Tarr and Potter's No. 1 D. A. Irion, dry and abandoned, total depth 3,942 feet. Humble Oil & Refining Co.'s No. 6 I. D. Smith, top sand 3,605 feet, initial production 74 bbls. per hour through three-fourths inch tubing choke, total depth 3,624 feet. Rancho Oil Corp.'s No. 4 Moyers, top sand 3,611 feet, initial production 48 bbls. in one-half hour through open tubing, total depth 3,643 feet. Sabinas Oil Co.'s No. 9-C Collins, top sand 3,682 feet, initial production 90 bbls. per hour through 1-inch tubing choke, total depth 3,692 feet. Stewart and others' No. 1 W. W. Penn, location abandoned.

Daily average oil shipments from East Texas week ending February 15:

SHIPMENTS THROUGH MAIN TRUNK LINES

Company, size and location—	Bbls.
Arkansas P. L. Co., 8-in., Shreveport	10,157
Atlantic P. L. Co., 10-in., Atreco	11,705
Atlas P. L. Co., 8-in., Shreveport	1,957
Gulf P. L. Co., 2 and 8-in., Oklahoma	14,935
Gulf P. L. Co., 2 and 8-in., Port Arthur	10,483
Humble P. L. Co., 2 and 10-in., Shreveport	38,917
Humble P. L. Co., 2 and 8-in., Todd	14,986
Liberty P. L. Co., 8-in., Rusk	1,700
Magnolia P. L. Co., 10-in., Center	21,665
Magnolia P. L. Co., 12-in., Corsicana	20,270
Shell P. L. Corp., 10-in., Houston	20,974
Sinclair Texas P. L. Co., 12-in., Teague	22,261
Sun Yount Lee P. L. Co., 10-in., Sun City	22,256
Texas P. L. Co., 10-in., Douglass	31,529
Texas Empire P. L. Co., 12-in., Port Arthur	38,831
Tidal Refining Co., 6-in., Carthage	none
Total	282,655

SHIPMENTS TO REFINERIES

Arrow Refining Co., Overton	S.D.
Beacon Refining Co., Henderson	1,421
Boone Refining Co., Arp	550
Central Refining Co., Friars Switch	S.D.
Constantin Refining Co., Overton	S.D.
Diamond Refining Co., Overton	251
East Texas Refining Co., Longview	7,076
East Texas Refining Co., Friars Switch	2,940
Gladetex Refining Co., Gladewater	350
Gladewater Refining Co., Gladewater	375
Kilgore Refining Co., Kilgore	643
W. B. Mackey Refining Co., Gladewater	450
Overton Refining Co., Overton	886
Petroleum Refractionating Co., Longview	S.D.
Sinclair Oil & Gas Co., Longview	1,000
Slack Refining Co., Camp Switch	S.D.
Southern Oil & Refining Co., Reed Switch	500
Taylor Refining Co., Tyler	1,574
Total	18,113

SHIPMENTS BY TANK CAR

Sabine P. L. Co. from Reed Switch	430
East Texas Ref. Co. from Longview	433
Tyler P. L. Co. from Tyler	171
Total	1,034
Total daily average distribution	301,791
Total daily average production	279,053
Daily average from storage	22,756

YATES POOL TITLE SUIT

AUSTIN, Tex., Feb. 22.—The State's title to 2,468 acres of oil land in Pecos County was sustained by District Judge Charles A. Wheeler, at the conclusion of a five-week contest in the State's suit against heirs of R. B. Whiteside and approximately 150 others. The decision sustained title of Ira G. Yates and associates to the land on which is located the Yates Pool, this land having been sold Yates under a survey which reserved to the public school fund royalties in land in a vacancy strip.

EAST AND EAST CENTRAL TEXAS WILDCATS

(Continued from Page 26)

DELTA COUNTY

Worthington et al's No. 1 Pejernett, 776 ft. from S and 150 ft. from W in E. Chick Sur., 1½ miles W of Horton ..... S.D. 3,315 ft.

ELLIS COUNTY

Clark-Brooks' No. 1 C. W. Golliday, 300 ft. from S line and 300 ft. from E line of tract and survey, John Bones Sur. ..... T.D. 2,140 ft.
E. M. Rogers' No. 1 John Lee Winn, 1,650 ft. from E and 150 ft. from S of Orland, Orlo Wheeler Sur. .... S.D. 1,435 ft.
Worthen Pet. Co.'s No. 1 Cerf, 3½ miles NE of Ennis. .. T.D. 2,264 ft.

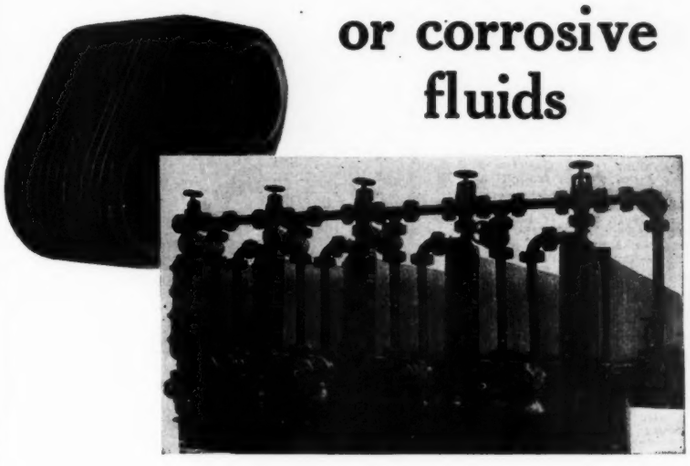
FRANKLIN COUNTY

Tom Harper's No. 1 fee, 150 ft. from N line and 200 ft. from E line of 116-ac. tr., W. M. Dawson Sur. .. Derrick.

GREGG COUNTY

Abernathy & Kirkpatrick's No. 1 R. M. Wood, center of Lot No. 3, R. H. Hokit Sur. ..... Waiting on cmt. to set 915 ft.
P. J. Alco's No. 1 F. Thomas, 160 ft. from S line and 150 ft. from W line of 10-ac. lease, C. H. Alexander Sur. ..... Spudding.
Atlantic Production Co.'s No. 1 A. V. Backe, 330 ft. from N and E lines of lease, G. W. Hooper Sur. ..... Testing 3,639 ft.
Barnsdall Oil Co.'s No. 1 Grant Benson, 330 ft. from S and E lines of 50-ac. tr., W. P. Chisum Sur..... Location.
Barnsdall Oil Co.'s No. 1 Adams, 330 ft. S and E of NE cor. of Shell's Slaton lease, G. W. Hooper Sur... Location.
Beard et al's No. 1 J. J. Fuller, 330 ft. from S and W lines of 69.7-ac. tract, M. Alexander Sur. ..... Drlg. 1,900 ft.
Brown et al's No. 1 Florence, 150 ft. from N and W lines of 2.58-ac. tract, Mary Van Winkle Sur..... Set surface csg.
Will Brown's No. 1 E. Choice, 400 ft. due east of Collins' No. 1 H. T. Elder ..... Derrick.
Bob et al's No. 1 T. L. Broy, 290 ft. from E and 1,640 ft. from S of H. A. Holdt Sur. ..... Derrick.
M. T. Beeler's No. 1 Finley and Thomas, 150 ft. from N and 150 ft. from W of 10-ac. lease, C. H. Alexander Sur. .. .. Derrick.
Byrd-Frost Oil Co.'s No. 1 Alexander and Strong, 330 ft. from S and E lines of 26-ac. tract, M. Tennison Sur. ..... Derrick.
E. L. Chapman's No. 1 J. Clayborn, 275 ft. S and 158 ft. W of NE cor. of 4-ac. lease, I. Baty Sur..... Rigging up.
Danciger Oil & Ref. Co.'s No. 1 S. Ball, located on a 2-ac. tract, Mary Van Winkle Sur. ..... Derrick.
Degener & Co., Inc.'s No. 1 Savannah Belle, located on 2-ac. tract, Mary Van Winkle Sur. ..... Moving in rig.
Demotte et al's No. 1 T. L. Bray, center of Blk. No. 8, H. R. Hokit Sur. ..... Rigging up.
Dodd and Markey's No. 1 J. F. Holt, 615 ft. E and 707 ft. N of SW cor. of 200-ac. tract, H. Edwards Sur... Derrick.
W. L. Duninger's No. 1 C. C. Stoen, 350 ft. from S and E lines of 59-ac. tract, J. Baty Sur. ..... Derrick.
East Texas Refining Co.'s No. 1 Tom Christian, center of lease, G. W. Hooper Sur. ..... Drlg. 2,935 ft.
Empire Gas & Fuel Oil Co.'s No. 1 V. L. Taylor, 330 ft. from N line and 352 ft. from W line of 40.85-ac. lease, M. Tennison Sur. ..... Spudded.
F. H. E. Oil Co.'s No. 1 J. M. Christian, 330 ft. from S line and center of E and W lines of E 7.5-ac. tract, G. W. Hooper Sur. ..... Testing 3,661 ft.
Faith Oil Co.'s No. 1 Walters, 246 ft. E of W line and 145 ft. N of S line and SW cor. of survey, B. W. Witcher Sur. ..... Set surface csg.
Ralph Fenton's No. 1 J. H. Alexander, center of W 5 acres of N 10 acres of 50-ac. tract, D. Sanches Sur. ..... Derrick.
B. F. Findley's No. 1 Vine Lodge, center of 1-ac. lease and tract, J. W. Bradshaw Sur. ..... Derrick.
A. B. Gippert et al's No. 1 L. Bailey et al, center of 6¾-ac. lease, James Norris Sur. ..... Derrick.
Glasscock Bros.' No. 1 E. Bade, 157 ft. from S line and 409 ft. from W line of lease, G. W. Hooper Sur. ..... Derrick.
Lewis Godlin's No. 1 E. L. Walker, 330 ft. N of road, 330 ft. from E line of 80.2-ac. tract, M. Dillard Sur... Derrick.
Gulf Production Co.'s No. 1 A. King, 120 ft. E and 330 ft. N of SE cor. of church, John Moffit Sur..... Location.
Gulf Production Co.'s No. 1 R. H. Still, north offset to Turnbow's No. 2 Elder, John Wilkerson Sur. ..... Rigging up.
Gulf Production Co.'s No. 1 E. L. Walker, 810 ft. N and 370 ft. W of SE cor. of lease, John Tate Sur..... Moving in.
Hastings et al's No. 1 Wallace, due SE offset to Victory Smith's No. 1 Knowles, M. Tennison Sur. ..... Moving in.
Harry Hamberry's No. 1 W. E. Foshee, center of 2.56-ac. tract, H. R. Hokit Sur. ..... Drlg. 3,620 ft.
J. F. Heard's No. 1 fee, 200 ft. SW of Pace's No. 1 Elder, Mary Van Winkle Sur. ..... Moving in material.
D. M. Hester's No. 1 Crews, 299 ft. W. and 166 ft. S of SE cor. of William W. Friars Sur. ..... Set surface csg.
D. L. Hoffman's No. 1 B. F. Phillips, 330 ft. from E line and center of N and S lines of 16.5-ac. tract, D. Ferguson Sur. ..... Drlg. 2,135 ft.
Humble Oil & Refining Co.'s No. 1 J. H. Sheppard, 330 ft. from S and W lines of lease, T. Allen Sur. .. .. Derrick.
Imperator Oil Co.'s No. 1 Geo. Ritchie, 120 ft. N and 15 ft. W of Monzell and Currie's No. 1 Church, Blk. No. 4, M. Dillard Sur. ..... Coring 3,555 ft.
Jackson and Bradstreet's No. 1 M. Young, center 2-ac. tract, J. R. Crosby Sur. ..... S.D. 200 ft.
Jones and O'Brien's No. 1 Hughy-Ross, 1,310 ft. N and 332 ft. E of SE cor. of William McQurry Sur. .. T.D. 3,505 ft.
Kroll's No. 1 J. Spear, center ¾-ac. lease, Blk. 4, Mary Van Winkle Sur. ..... Set csg. 3,523 ft.
K. B. Oil Co.'s No. 1 Dickson, 150 ft. from S and 150 ft. from W of 5-ac. lease, Mary Van Winkle Sur..... S.D. 700 ft.
Lucy Petroleum Co.'s No. 1 B. C. Christian, 330 ft. from W line and center of N and S lines of 8-ac. lease, G. W. Hooper Sur. ..... Location.
McBride's No. 1 F. Elder, 205 ft. N and 320 ft. W of SE cor. of 26-ac. lease, John Wilkerson Sur. ..... Derrick.
Manzell et al's No. 1 C. H. Moore, center of Blk. No. 3, M. Dillard Sur. ..... Drlg. 3,537 ft.
National Oil Co.'s No. 1 L. Martin, 330 ft. from N and W lines of 20-ac. lease, W. P. Chisum Sur. ..... Derrick.
J. D. Patty et al's No. 1 J. C. McCormick, 207 ft. SE at right angles to Gladewater-Tyler road and 640 ft. SW of Abernathy and Kirkpatrick's No. 1 Gregston, M. Dillard Sur. ..... T.D. 100 ft.
Tom C. Patten's No. 1 Geo. Walter, center of 1-ac. tract, and 396 ft. from W line of lease, Mary Van Winkle Sur. ..... Derrick.
Peterson and Merritt's No. 1 Hem, center of 1-ac. tract of SW cor. of Meridian's Lee lease, L. J. Rigsby Sur. ..... Derrick.
Pilot Oil Co.'s No. 1 H. Smith, center of 3,67-ac. lease, William Robinson Sur. ..... Rig up.
Pilot Oil Co.'s No. 1 G. S. Maddox, center of S 8-ac. of W 15 acres of 55-ac. tract, D. Sanches Sur. ..... Rig up.
Rajo Oil Co.'s No. 1 Barrett, 356 ft. from S line and 330 ft. from W line of Shell's 80-ac. lease, Witcher Sur... Drlg. 2,740 ft.
Reeves et al's No. 1 W. L. Hestland, center of five-eighths-acre tract, midway from Lampton Church and Sarson's No. 1 Hall, D. Sanches Sur. ..... Derrick.

Maintains capacity when heating or cooling dirty or corrosive fluids



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Type KC

is the only closed type heat exchanger which will maintain its rated capacity when handling dirty fluids. This is because of its unique construction of four straight tubes between which heat is conducted by closely-spaced metal fins and through which the hot and cold liquids flow with a high velocity, thereby preventing deposit of sediment.

The design further permits the use of thick-walled tubes or corrosion-resistant materials which provide longer life than is possible of other types of closed heat transfer apparatus.

Users report that G-R Tubeflo Sections remain clean indefinitely on difficult services which quickly cause standard shell-and-tube designs to lose capacity and effectiveness due to accumulation of sediment.

These units may be installed in series, parallel, or series-parallel connection for any desired duty and are built for pressures up to 8000 lb. per sq. in.

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Heat Transfer Apparatus

Roeser & Pendleton's No. 1 E. Nicholson, 330 ft. from S line and 150 ft. from W line of lease, Marshall Mann Sur. ..... Drlg. 280 ft.
Roeser & Pendleton's No. 1 J. M. Farmell, 175 ft. from W line and 330 ft. from S line of 43-ac. lease, D. Sanches Sur. ..... Derrick.
Ross et al's No. 1, located on Findley & Thomas 50-ac. tract, 150 ft. from S line and 6.66-ac. lease, C. H. Alexander Sur. ..... Derrick.
R. J. S. Germain's No. 1 L. Martin, 343 ft. S and 330 ft. W of NE cor. of 32-ac. lease, T. Johnson Sur. .. Rig up.
Shell Pet. Corp.'s No. 1 B. F. Laird, N offset to Robertson's No. 1 Elder, John Wilkerson Sur. ..... Drlg. 2,645 ft.
Shell Pet. Corp.'s No. 1 S. C. Fishborn, 330 ft. from N and E lines of 100-ac. lease, F. W. Johnson Sur. ..... Location.
Shell Petroleum Corp.'s No. 1 M. J. Register, 370 ft. from N line and center of E and W lines of 50-ac. tract, D. Dainwood Sur. ..... Moving in.
E. L. Smith's No. 1 E. E. Anderson, 330 ft. from S line and center of E and W lines of 19-ac. tract, G. W. Hooper Sur. ..... Rig up.
V. C. Smith's No. 1 M. B. Hughey, center of Blk. No. 123, Mary Van Winkle Sur. ..... Derrick.
Victor C. Smith's No. 1 Knowles, center of Blk. 124, Mary Van Winkle Sur. ..... Derrick.
Stanolind Oil & Gas Co. and Simms Oil Co.'s No. 1 Akin, 330 ft. from S and E lines of lease, W. H. Castleberry Sur. ..... Derrick.
Sun Oil Co.'s No. 1 G. Reeves, 1,073 ft. from S line and 338 ft. from W line of lease, James Hay Sur. ..... Moving in.
Thompson's No. 1 Cole, E offset to Petroleum Finance's No. 2 Lacy, M. T. Cole Sur. ..... Rigging up.
M. E. Trapp et al's No. 1 A. N. Neeley, center of 1.75-ac. tract out of Lion Oil & Ref. Co.'s J. R. Williams lease, P. McAnnally Sur. ..... Drlg. 1,150 ft.
Valentine Oil Co.'s No. 1 Goyne-Hughey, 6,100 ft. from S and 6,800 ft. from W of survey, Mary Van Winkle Sur. ..... Rigging up.
Waggoner and McCowell's No. 1 A. J. Green, 25 ft. from NW cor. of Blk. No. 81, M. Dillard Sur. ..... Derrick.
Wells and Gann's No. 1 Hawkins, center of 1½-ac. tract and 350 ft. due south of Church Lot No. 1, W. P. Chisum Sur. ..... Drlg. 2,900 ft.
Wiseman et al's No. 1 C. Jones, center of 45-ac. tract, G. W. Hooper Sur. ..... Derrick.
Yount Lee Oil Co.'s No. 2 I. Benson, 200 ft. from N line and 330 ft. from E line of "B" lease, D. Sanches Sur. ..... Drlg. 2,658 ft.

HENDERSON COUNTY

South American Drlg. Co.'s No. 1 D. R. Broone, 330 ft. from N and W lines of SE 40 acres of 425-ac. tract, Thomas Parmer Sur. ..... S.D. 4,374 ft.

HILL COUNTY

Sherman-Houseman's No. 1 J. F. Griffith, in Samuel Waddell Sur. ..... Fishing 3,256 ft.

HOPKINS COUNTY

E. L. Chapman's No. 1 J. D. Jumper, 175 ft. from N line, 285 ft. from W line of lease, Jas. Webb Sur... S.D. 230 ft.
Roark et al's No. 1 Taylor, 220 ft. from N and W lines of 80-ac. tract in the John Polk Sur. .. .. S.D. 540 ft.

HOUSTON COUNTY

Apex Drlg. Co.'s No. 1 Thompson Bros., 250 ft. out of NW cor. of 200-ac. tract in John Shears Sur. ..... T.D. 2,364 ft.
Ramsland and Ramsland's No. 1 Pennington, 750 varas W of E line and 500 varas from S line of survey on 186-ac. tract, Ramond LaGarza Sur. ..... S.D. 1,692 ft.
C. T. McManus' No. 1 Harron, 300 ft. out of NE cor. of 327-ac. tract, J. P. Procella Sur. ..... Spudded and S.D. 37 ft.

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HUNT COUNTY

Branson et al's No. 1 Gray ..... Location.
Russell et al's No. 1 Brooks and Quattlebaum ..... S.D. 1,455 ft.

KAUFMAN COUNTY

Hoffpier et al's No. 1 Kaufman County Farm, 210 ft. from N line, 672 ft. from W line of 524-ac. tract, D. Falcon Sur. ..... Derrick.
Standy Darnell et al's No. 1 Sally Pannill ..... T.D. 1,500 ft.

LAMAR COUNTY

G. W. Davy et al's No. 1 McGustion, 450 ft. from S line, 450 ft. from W. line of farm and survey, Galet Wood Sur. ..... S.D. 2,880 ft.
Doyle and Jondeau's No. 1 Martin, 990 ft. from N line and 330 ft. from E line of tract, Joseph Deck Sur. ..... Derrick.
Optometrist Oil Club's No. 1 J. M. McFadden, 450 ft. from S and W lines of McFadden E 25-ac. tract, J. Deck Sur. ..... S.D. 2,096 ft.

LEON COUNTY

Salzer Drlg. Co.'s No. 1 Dr. J. M. Blair, 1,010 ft. from N line, 1,986 ft. from W line, Sec. 19, Blk. E, Lucia Hibbard Sur. ..... Derrick on ground.

MORRIS COUNTY

Dumas et al's No. 1 Tom Ball, 1,046 ft. from E and 248 ft. from S of 71-ac. tract, A. S. Young heirs Sur... S.D. 3,541 ft.

NACOGDOCHES COUNTY

Adams et al's No. 1 Fuller Brothers, located in a 269-ac. tract, Jose Flores Sur. ..... Location.
Gainer et al's No. 1 Nice Well, 18 miles SE of Nacogdoches, 600 ft. from S and 150 ft. from W of Wells tract in A. Cherino Sur. ..... S.D. 3,430 ft.
Joiner and Henson's No. 1 Andy Legg, 330 ft. from N and 330 ft. from W of tract, John Durst Sur. ..... S.D. 3,920 ft.
Scully & Harwell's No. 1 R. I. Driver, 1,500 ft. from SE cor. of P. B. Ballard 125-ac. tract, 15 miles SE of Nacogdoches in Patricia De Torres Sur. ..... Drlg. 3,720 ft.
Taylor-Vaughn's No. 1 Dixon Greer, 160 ft. from W and 450 ft. from N lines of 60-ac. tract in the M. G. Horrera Sur. ..... S.D. 265 ft.
Creighton Drlg. Co.'s No. 1 J. N. Stewart, center of 79-ac. tract in the Jose Ignacio Y. Barbo Sur. ..... S.D. 3,226 ft.

POLK COUNTY

Humble Oil & Refining Co.'s No. 2-A West Texas Lumber Co., 1,902 ft. S and 70 deg. W along property line from N cor. of survey, thence 100 ft. SW of right of way, M. Chavence Sur. ..... Drlg. 352 ft.
Sunshine Oil Co.'s No. 1 Brawley, 150 ft. from S line and 250 ft. from E line of W 100 acres of lease, F. Johnson Sur. ..... Derrick.

RAINS COUNTY

C. H. Bayliss' No. 1 Ownby, 150 ft. N and 1,100 ft. from E of most easterly SE cor. of survey, Alexander Sur. ..... S.D. 4,036 ft.

RED RIVER COUNTY

Gibbs et al's No. 1 Mace (old well being drilled deeper), 1,200 varas from S line, 1,500 varas from E line of survey, Wm. Cullam Sur. ..... S.D. 3,520 ft.
Hoffman and Henson's No. 1 H. H. Lennox, 2,790 ft. W. and 300 ft. S of most easterly NE cor. of survey, J. E. Edmondson Sur. ..... S.D. 60 ft.
Harris & Joiner's No. 1 E. Howison, 225 ft. S, 185 ft. W of 79-ac. tract, Wm. Humphreys Sur. ..... S.D. 1,940 ft.
Concord Oil Co.'s No. 1 J. R. Dellahunty, 500 ft. from N of Isaac Moore Sur. and 200 ft. E of E line of Robert Glass Sur. ..... S.D. 2,530 ft.
L. G. Priest's No. 1 J. M. Stiles, 900 varas S and 500 varas E most northerly NE cor. of Jones Bankston Sur. in the Levi Dean Sur. ..... S.D. 1,770 ft.

ROCKWALL COUNTY

Bucanner Oil Co.'s No. 1 H. L. Lofland, center of 69-ac. tract in W. M. Bird Sur. ..... Set 10-in. csg. 120 ft.

RUSK COUNTY

Barney Carter's No. 1 Jessie Cole, 225 ft. from N line and 160 ft. from E line of 5-ac. tract, D. Shaw Sur. ..... Setting surface csg.
S. P. Borden's No. 1 R. G. Mason, center of 7.5-ac. lease and 286 ft. N and W of NE cor. of Magnolia's Moore tract ..... Drlg. 3,626 ft.
Brooks Petroleum Co.'s No. 1 J. M. Mayfield, 330 ft. from N line and 150 ft. from W line of 22-ac. lease, D. Clark Sur. ..... Location.
Butler and Calhoun's No. 1 C. C. Lowe, 225 ft. from N line and 200 ft. from E line of 85-ac. lease, W. G. Tutt Sur. ..... Bldg. derrick.
Byrd-Frost's No. 1 Buckner, J. E. Peyton Sur. ..... S.D. 2,981 ft.
George Demontrand's No. 1 L. J. Pinkston, 330 ft. from S and E line of 32.4-ac. lease out of 74.3-ac. tract, M. J. Pru Sur. ..... Drlg. 2,100 ft.
Cordova Union Oil & Gas Co.'s No. 1 C. O. Christian, 330 ft. from S and E lines of 40-ac. lease, W. A. Elliott Sur. ..... Derrick.
Everts Drilling Co.'s No. 1 Knights and Tabor, 2,700 ft. from N line and 75 ft. from E line of survey, Henry Hobson Sur. ..... Drlg. 1,832 ft.
C. A. Everts' No. 1 Cole, 210 ft. from N line and 330 ft. from E line of 50-ac. lease, D. Shaw Sur. .. Derrick.
E. E. Fogelson's No. 1 D. Wadley, center of 15-ac. tract, D. Clark Sur. ..... Location.
P. T. Fullwood's No. 1 W. N. Brightwell, 275 ft. E of Horse Shoe Syndicate's No. 1 Brightwell, R. E. Winn Sur. ..... Set surface csg.
Golding and Murchison's No. 1 J. D. Strickland, 330 ft. from N and W lines of 183-ac. tract, M. V. Pena Sur. ..... Coring 3,620 ft.
Great Eastern Oil Co.'s No. 1 C. O. Christian, 150 ft. from N line and 230 ft. from E line of lease, J. S. Whiteman Sur. ..... Derrick.
Gulf Production Co.'s No. 1 J. W. Shaw, 330 ft. from S and W lines of 89.8-ac. tract, F. Cordova Sur. ... Drlg. 3,737 ft.
Gulf Production Co.'s No. 1 W. O. Alford, 330 ft. from E line and 330 ft. from SW line of 140-ac. tract, M. Hussner Sur. ..... Bldg. derrick.
Hale and Hatchfield's No. 1 C. J. Goforth, 625 ft. from S line and 450 ft. from W line of 13.4-ac. tract, M. J. Pru Sur. ..... Rig up and S.D.
Hathaway et al's No. 1 Gray, J. M. McLain Sur. ..... S.D. 3,196 ft.
H. E. Hiden's No. 1 Varney, 100 ft. from N line, 125 ft. from E line of road, W. G. Tutt Sur. ..... Derrick.
Holland et al's No. 1 S. E. Brox, 330 ft. from N line and 250 ft. from W line of 20-ac. lease, Thomas Grey Sur. ..... Derrick.
Howell's No. 1 Irion and Motley, 200 ft. from N line, 1,270 ft. from W line of survey, J. Lindley Sur..... Drlg. 2,300 ft.
Humble Oil & Refining Co.'s No. 1 T. Barton, 150 ft. S and 330 ft. E from NW cor. of 50.5-ac. lease, Thomas Grace Sur. ..... Waiting on rig.
T. F. Hunter's No. 1 J. Johnson, 330 ft. from E line and 171 ft. from N line of 13-ac. lease, H. B. Dance Sur. ..... Rigging up.
A. W. Jones Oil Co.'s No. 1 J. M. Grant, 346 ft. from S line, 1,076 ft. from E line of 100-ac. tract, T. J. Walling Sur. ..... Fishing 2,410 ft.
LaSalle-Davenport and Bledsoe's No. 1 Church, 175 ft. S and 175 ft. E of SE cor. of Sun-Schuler joint lease, J. B. DeCadena Sur. ..... Moving in material.
Moss and Urschel's No. 1 H. L. Griffin, 200 ft. from N line and 150 ft. from W line of 20-ac. lease, Juan Ximenes Sur. ..... T.D. 3,697 ft.

Mid-Kansas Oil & Gas Co.'s No. 1 George W. Moore, 425 ft. from N line and 330 ft. from S line and 1,105 ft. from E line of 85-ac. tract, W. J. Roan Sur. ..... Derrick.
Mid-Kansas Oil & Gas Co.'s No. 1 H. C. Burton, 1,375 ft. from S line and 330 ft. from E line of 59.5-ac. lease, W. D. Porter Sur. ..... Moving in rig.
Geo. L. Pace's No. 1 E. B. Alford, center of 5-ac. lease, T. J. Moore Sur. ..... Drlg. 2,610 ft.
Pace Petroleum Co.'s No. 1 Wells, W offset to East Texas, W. P. Chisum Sur. ..... Derrick.
Pansy Oil Co.'s No. 1 E. B. Alford, center of Lot No. 35, T. J. Moore Sur. ..... Derrick.
Reynolds-Blankenship & Trapp's No. 1 Church lot, 200 ft. E of Tex Jersey's No. 1-A Keeling and 50 ft. SW of Hoosier's No. 1-A Neal, F. Cordova Sur. ..... Drlg. 3,748 ft.
J. T. Reese's No. 1 Marshall Clay, 330 ft. from N and W line of 65-ac. lease, Juan Ximenes Sur. ..... Drlg. 1,460 ft.
Ross Seward's No. 1 Burton, J. J. Y'Barbo Sur. ..... S.D. 3,077 ft.
R. E. L. Silvey's No. 1 P. G. Warren, 155 ft. from S line and 96 ft. from E line of 44-ac. tract, John Womack Sur. ..... Derrick.
Jay Simmons' No. 1 D. C. Joyner, 2,050 ft. from S line and 300 ft. from W line of 74.11-ac. tract, F. Cordova Sur. ..... Derrick.
Sinclair Oil & Gas Co.'s No. 1 W. H. McCord, 144 ft. from N line and 330 ft. from W line of lease, J. B. DeCadena Sur. ..... Waiting on cmt. to set 3,624 ft.
Skelly et al's No. 1 I.&G.N., 1,230 ft. from E line and 660 ft. from S line of survey, J. S. Carrithers Sur. .. Rig up.
Stanolind Oil & Gas Co. and Pure Oil Co.'s No. 1 W. H. Sl.er, 330 ft. from N and W lines of 231.8-ac. tract, T. M. White Sur. ..... Bldg. derrick.
The Texas Company's No. 1 W. W. Henry, 330 ft. from S and E lines of 229-ac. tract ..... Drlg. 3,614 ft.
M. L. Thompson's No. 1 Price, Hugh Million Sur. ..... S.D. 3,280 ft.
Weaver-Crim Corp.'s No. 1 M. E. Peterson, 330 ft. from S line and center of E and W line of lease, W. P. Chisum Sur. ..... Moving in.
Weaver-Crim's No. 1-F. Bean, 175 ft. from NW line and 212 ft. from S line of 16-ac. lease, Mary Cogswell Sur. ..... Derrick.
G. C. Wood's No. 1 J. B. Irwin, 154 ft. from N line and 108 ft. from W line of 35.41-ac. lease, J. Lindley Sur. ..... Derrick.

JOINER POOL—RUSK COUNTY

Armstrong's No. 1 Alford, 151 ft. from S and 1,080 ft. from W of survey, T. J. Moore Sur. ..... Rigging up.
Paulett et al's No. 1 Ed Sparks, 350 ft. from E. 150 ft. from S of survey, L. C. Riggs Sur. ..... S.D. 1,765 ft.

SAN AUGUSTINE COUNTY

A. H. Jones and Tennant's No. 1 A. P. Davis ..... T.D. 2,472 ft.
Smith and Baker's No. 1 Pickering Lbr. Co., 6 miles N of San Augustine, E. Quick Sur. ..... Derrick.

SMITH COUNTY

Acme Oil Co.'s No. 1 Horton, 330 ft. from N and W lines of tract, Mar Sewell Sur. ..... S.D. 1,028 ft.

TITUS COUNTY

Perry V. Cook's No. 1 M. C. Rogers, center of SW of Moore Sur. ..... Drlg. 3,495 ft.
Joiner et al's No. 1 Clayton Brown, 1,300 ft. from E and 400 ft. from most northerly S line of V. Evans Sur. S.D. 2,250 ft.

UPSHUR COUNTY

L. G. Bradstreet et al's No. 1 O. M. Victory, 330 ft. from N and E lines of 10-ac. lease, E. A. J. Evans Sur. ..... Location.
Clarston et al's No. 1 Eva O'Byrne, 250 ft. from N line and 200 ft. from E line of E 17 acres of 32.17-ac. tract, S. Harwell Sur. ..... Moving in.
E. & D. Oil Co.'s No. 1 J. W. Free, 200 ft. N and 394 ft. W of SE cor. 20.5-ac. Free tract ..... Waiting on cmt. to set 3,698 ft.
Falvey et al's No. 1 S. D. Rodden, 227 ft. from N line and 330 ft. from E line of 20-ac. lease, M. Mann Sur. ..... Drlg. 2,750 ft.
Eslick et al's No. 1 H. F. Whitehurst, 330 ft. out of SW cor. of 5.80 acres of W 40 acres of Whitehurst 100-ac. tract ..... Set csg. 40 ft.
J. C. McFarland et al's No. 1 Willie Starr, center of S 40 acres of Starr 96-ac. tract, Charles Cooper Sur. ..... Location.
Saturn Oil Co.'s No. 1 W. F. Smith, 330 ft. from E line and center of N and S lines of S 25 acres of W 80 acres of 100-ac. tract, J. Pineda Sur. ..... T.D. 3,658 ft.
Jackson and Bradstreet's No. 1 Victory, center of 25-ac. lease, E. A. J. Evans Sur. ..... Waiting on cmt. to set 3,585 ft.
L. E. Trout et al's No. 1 O. M. Victory, 330 ft. from S and E lines of 60-ac. lease, E. A. J. Evans Sur. ... Derrick.
Wolf's No. 1 Cook, center of 115-ac. tract in Jacob Walker Sur., 5 miles W of Rosewood ..... S.D. 1,100 ft.
Wood and Nelson's No. 1 H. S. Coslett, 500 ft. N and W of SE cor. of Coslett 2.48-ac. tract, B. F. Howard Sur. ..... S.D. 2,960 ft.

VAN ZANDT COUNTY

Barton et al's No. 1 C. L. Hubbard, 600 ft. out of NE cor. of Hubbard 225-ac. tract, 3½ miles S of Canton, M. J. DeCadena Sur. ..... S.D. 2,104 ft.
Kelly O. & G. Co.'s No. 1 Lemsford, center of Lemsford tract, John Conner Sur. ..... S.D. 2,300 ft.
Thomasson, Inc.'s No. 2 W. P. Forster, 600 ft. from N and 450 ft. from E of SW cor. of Forster 151-ac. tract in the F. Montgomery Sur. ..... S.D. 3,200 ft.
Priest et al's No. 1 B. G. Beckham, 150 ft. from S line, 33 ft. from W line of 100-ac. tract, A. S. Johnson Sur. Drlg. 5,396 ft.
Pure Oil Co.'s No. 2 Mrs. C. White, 250 ft. E of W line, 250 ft. S of N line, John Walling Sur. ..... Drlg. 350 ft.
Pure Oil Co.'s No. 1 D. F. Cade, 250 ft. N of S line of 45.3-ac. tract in Nacogdoches County School Land Sur. ..... Drlg. 2,630 ft.
Pure Oil Co.'s No. 1-T V. T. Davis, 400 ft. N of N line of Tunnell No. 8 lease, 480 ft. W of E line of survey, Nacogdoches County School Land Sur. ..... Set 7-in. csg.; T.D. 6,795 ft.
Pure Oil Co.'s No. 9 F. B. Smith, 1,180 ft. E of W line and 150 ft. N of S line, John Walling Sur. ..... Cmt'd. csg.
Pure Oil Co.'s No. 1 E. Morris 597 ft. N of S line and 250 ft. E of W line of lease, John Walling Sur. ..... Drlg. 2,225 ft.
Pure Oil Co.'s No. 5 Mary P. Neills et al, 200 ft. N of S line and 225 ft. W of E line of 100-ac. lease, James Ross Sur. ..... Drlg. 1,640 ft.
Pure Oil Co.'s No. 3, 225 ft. S of N line and 225 ft. W of E line, J. Stephenson Sur. ..... Derrick.
Pure Oil Co.'s No. 2 A. R. Humphreys, 200 ft. S of N line and 225 ft. E of W line of lease, A. McPhail Sur. ..... Drlg. 375 ft.
The Texas Company's No. 1 R. V. White, 250 ft. E of W line and 200 ft. N of S line of lease, Nacogdoches County School Land ..... Cmt'd. csg.
The Texas Company's No. 3 J. A. Bracken, 684 ft. S of N line and 350 ft. E of W line of lease, John Walling Sur. ..... Cmt'd. csg.
Van Oil Association's No. 1 Tankersley, 200 ft. from E and 1,000 ft. from S of farm, L. Landers Sur. ..... S.D. 2,850 ft.

WOOD COUNTY

Talko Oil Co.'s No. 1 G. T. Ross, B. L. Smith Sur. ..... S. D. 1,550 ft.
Wood County Dev. Co.'s No. 1 Davis, approximately 180 ft. from S line of 160-ac. tract and 2½ miles S of Kantes in Sarah McDonald Sur. ..... Moving in rig.
Yankee Oil Co.'s No. 1 Davis, 330 ft. from S of NW cor. of M. Ryan, Jr., Sur. ..... S.D. 3,596 ft.

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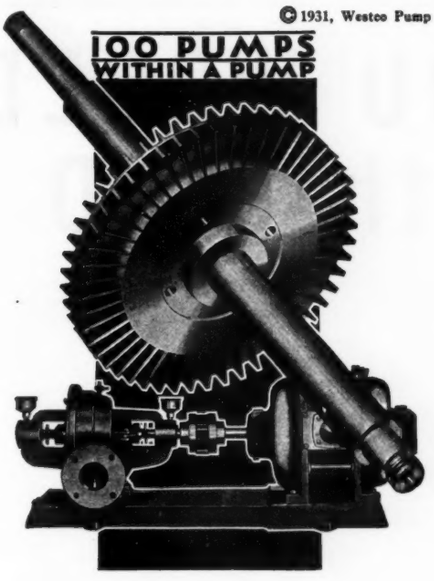

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The Westco Turbine Pump possesses the remarkable characteristic of being able to handle large amounts of vapor along with the liquid. For this reason, Westco is particularly efficient when pumping light, volatile gasoline, propane, etc., of 100° to 130° A. P. I. gravity. On these severe duties, this turbine-type pump will operate against pressures up to 300 lbs. per square inch *without* vapor binding.

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2. Can be economically furnished in special metals to withstand corrosion.
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4. Entire absence of vibration.
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6. Ball-bearing construction.
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Brief Items for Petroleum Refiners

New Ethyl Standard Requires Base Fuel Be at Least 59 O.N.

Within another week all Ethyl Gasoline sold at filling stations will be 78 octane number or better. This minimum specification was announced early in November to be made effective March 1 and thus increases the minimum antiknock value from 74 octane number to 78.

This decision was reached by the Ethyl Gasoline Corp. after an exhaustive survey of trends in the automotive and refining industries and has been made a part of the program of supplying fuels satisfactory for the operation of the new automobile motors of gradually increasing compression ratio.

Under the terms of the contract made by the licensees of the Ethyl Gasoline Corp. a reduction in the royalty becomes effective March 1 which partially equalizes the additional fluid needed to meet the 78 octane minimum. A refiner having a base gasoline of exceptionally good antiknock value may add as little as .9 of a c.c. of the Ethyl fluid per gallon of gasoline which is the minimum allowed, and with the cost of the fluid at .35 cent per c.c., the cost of the fluid per gallon of blended gasoline will be .315 cent. To this is added the new royalty which is .425 cent per gallon and the total cost to the refiner is .74 cent or approximately three-fourths cent per gallon. To use this small amount the refiner must have a base gasoline of about 69 octane number.

The other extreme of conditions would be where the refiner needed to use the maximum amount of Ethyl fluid which is 3 c.c. per gallon of finished motor fuel. In this case the 3 c.c. will cost 1.05 cents and the royalty charge will increase the cost at the plant .425 cent or the total cost will be 1.475 or very close to 1½ cents. In using the 3 c.c. of fluid this refiner must have a base fuel of at least 59 octane number.

It becomes apparent then, that the cost of using the Ethyl fluid to the refiner will lie somewhere between three-fourths cent and 1½ cents, depending upon the antiknock value of the base fuel, but a factor of equal importance in the matter of cost is the relative cost of making the base fuel.

Where there is crude available which yields straightrun gasoline of high antiknock value the cost is naturally low.

NEW COMPANY TO TAKE OVER CRUMP REFINERY

OKLAHOMA CITY, Okla., Feb. 22.—Application for a charter for the Major Oil & Refining Co. has been filed by W. U. Paul of Oklahoma City and C. H. Fox of Bristow, who have taken over the Crump Refineries plant north of the Oklahoma City Field.

The plant has a capacity of 2,500 bbls. daily, but shortly after completion the property became entangled in litigation and has not been run.

The plant will get its supply of crude from the Springrose Drilling and Acme Gas & Oil properties, for which Mr. Paul is superintendent.

TIDE WATER ADDS UNIT

The Tide Water Oil Co. is engaged in increasing the cracking capacity of its Bayonne, N. J., refinery. The new equipment now under construction is the Tube and Tank type and has a capacity of 7,000 bbls. daily. The Bayonne refinery at present has Tube and Tank cracking units in operation with a capacity of 15,000 bbls. daily.

BRITISH TARIFF TO ASSURE GROWTH IN HOME REFINERIES

NEW YORK, Feb. 20.—Imposition of a general import duty on imports of gasoline and other refined petroleum products into the United Kingdom, effective March 1 as a part of the new general tariff law of Great Britain, will result in a further curtailment of shipments of gasoline from the United States to England, according to reports from London this week, with Trinidad and other British oil-producing and refining colonies expected to benefit substantially from the change.

Under the provisions of the new tariff law, an ad valorem duty of 10 per cent will be imposed on gasoline and other refind products. The new law also provides for a superstructure of tariffs, to be applied by an advisory committee, which will be empowered to impose additional duty up to 100 per cent, in addition to the 10 per cent duty, on goods from countries which discriminate against Great Britain.

In as much as the United States is currently supplying the United Kingdom with approximately 30 per cent of its refined petroleum consumption, notwithstanding substantial reductions in shipments last year, the position of the United States oil industry in relation to the new British tariff laws has aroused great interest in British oil circles.

Shipments of refined petroleum from the United States into the United Kingdom last year showed a decline of close to 29 per cent in volume, with its participation in the entire British imports from all sources down from the 41.6 per cent recorded in the previous year to 30.9 per cent for 1931.

Commenting on the possible effects of the new tariff law on American shipments of refined petroleum into the United Kingdom, the London "Petroleum Times" says editorially: "The position in regard to the United States and its exports of refined petroleum products to this country is immediately interesting, since America supplies our markets with over 30 per cent of its refined petroleum demands. It is obviously too early as yet to state what will be the exact position, but it can be taken for granted that the new tariff will not apply to imported crude oils, which, by reason of their unmanufactured state, do not come within the scope of the proposals. This advantage should, in itself, materially add to the expansion of our home oil refining industry."

The fact that crude oil will not be included in the list of commodities covered by the new British tariff law indicates the possibility of a revival in American business in crude with the United Kingdom, as well as the possibility of the sale of refinery equipment to British plants. British refineries last year were credited with operations at less than one-third of rated capacity, and it is anticipated that under the stimulus of the protection afforded by the new tariff imposts refinery operations in the United Kingdom will immediately quicken. There are a number of large and modern plants in England, and it would take a relatively light expenditure to put all of the less modern refineries in working condition to produce gasoline and other products by the latest improved refining methods.

Thus far, the only effect the pending British tariff has had upon the American industry has been increased shipments of lubricating oils, paraffin waxes and other minor products to England, in order to get the shipments in "under the wire" before the duties become effective on March 1. Strangely enough, there has been little effort made to pile up stocks of gasoline and kerosene in anticipation of the duty, probably due both to the lack of adequate empty bulk storage, and the fact that the 10 per cent impost on these products will not run into large figures.

P. S. TARBOX, LEADER IN REFINING FIELD, DEAD

OIL CITY, Pa., Feb. 20.—Philip S. Tarbox, 56, general manager of the Independent Refining Co. of the Quaker State Oil Refining Corp., died suddenly in his home here from a heart attack Wednesday, February 17. Funeral services were held Friday in the First Presbyterian Church, after which the body was taken to Warren, Pa., for interment.

Mr. Tarbox was born June 11, 1875, on a farm near Arkwright, N. Y., and attended the schools of that community and the Fredonia normal school. At the age of 19 he entered the employ of the New York Central Railroad as agent in North Warren, and held that position there and in Warren until 1905, when he obtained employment with the Warren Refining Co. He studied every phase of the oil refining industry, and in 1916 went to St. Mary's W. Va., as general manager of the Ohio Valley Refining Co. He came to this city in 1922 as general manager of the Independent Co. and became known as an able executive and an authority on refining.

For many years Mr. Tarbox was active in the affairs of the National Petroleum Association, serving as vice president and trustee at the time of his death. He was active in framing the policies of the association. He was also active in civic and welfare work at Oil City.

INCORPORATION PAPERS ARE FILED IN WYOMING

CASPER, Wyo., Feb. 22.—Portland Associates, Inc., of Portland, Ore., has filed certified copies of its articles of incorporation in Wyoming qualifying it to do business in this state. It is capitalized for $750,000 and lists its assets in Wyoming at $150,000. F. T. Griffith, president of the Portland Electric Power Co., acted as trustee for the company last year in drilling its No. 1 Beartooth, SE NE SE Section 29-56-97, on the Garland Dome in Big Horn County, which is rated as a 5,000-bbl. well. According to reports, this company has acquired the refinery of the Bighorn Oil & Refining Co. in Billings, Mont., and is rehabilitating it to run 1,000 bbls. of crude per day. It is known that more than 1,000 bbls. of black oil was shipped from the company's Garland well to a Billings refinery several months ago for test runs and that the company was looking into the feasibility of refining its own crude. The company's articles authorize it to engage in the producing, refining and transportation business.

A. W. LONG DIES

A. W. Long, 55, of Manhattan, Kans., former president of the Manhattan Oil Co., died at his home February 19. He organized the Manhattan company 35 years ago and was its active head until a year ago when he resigned.

Russians Plan to Enlarge Output of Cracked Gasoline

NEW YORK, Feb. 20.—The construction of one of the largest oil cracking programs in the world will be started at Grozny in the North Caucasus this spring, the estimated cost of which will be about $50,000,000, according to official advices from Russia. The new plant will consist of 24 cracking installations, and will refine annually 2,500,000 metric tons of solar fuel oil into 1,000,000 tons of high grade gasoline, 100,000 tons of casinghead gasoline, 200,000 tons of asphalt and other products. During the first year of construction work eight units are scheduled for completion.

Another new refinery is projected at Orsk, in the middle Volga region, initial construction having already been started. This plant will have an annual capacity of 3,000,000 tons of oil products and the estimated cost of construction is $32,400,000. Oil from the Baku fields will be utilized for the first few years and will be transported by tankers from Baku to Guriev on the Caspian Sea, while from Guriev to Orsk a pipe line 460 miles long is to be constructed. Construction will be started at both ends of the line simultaneously, and the line will cost in the neighborhood of $40,000,000. Later on, it is expected, the Orsk refinery will utilize oil from the Emba fields.

A commission of the Soviet Oil Trust is planning another oil refining plant at Orsk and the Emba-Orsk pipe line, 488 miles long. The construction of the plant, which will have an annual capacity of 1,500,000 metric tons of oil products, is scheduled for completion this year.

During the first 20 days of January the total oil output in the U.S.S.R. was 1,217,600 metric tons, of 97.4 per cent of the program.

NEW PLANT IN CANADA PLACED IN OPERATION

The new refinery of the Sterling Oil Refineries, Ltd., located at Moose Jaw, Saskatchewan, Canada, has been completed and is now operating. The new plant has a rated oil capacity of 2,000 bbls. daily with a 1,200-bbl. combination topping and cracking unit. It is the second plant to be built in Saskatchewan, the Imperial Oil, Ltd., operating a 7,200-bbl. complete refinery at Regina.

L. D. Ohm is president and general manager of the Sterling company. Hal Berry and S. A. Hamilton are vice presidents, James Kennedy secretary and treasurer and Don J. Baize plant superintendent. D. C. Archbald has charge of tank car sales.

NEW REFINERY CONTRACT

CHATHAM, Ontario, Feb. 22.—The Simrall Refining Corp. has awarded a contract for construction of a refining plant in Amherstburg, Ontario, to the Foster Wheeler Corp. of Toronto, the work to be completed before April 1. The refinery will be on the Detroit River north of Amherstburg.

BUILD TOPPING PLANT

The Midland Oil Refining Co. of Denver has announced plans for the construction of a topping plant to be located near Denver. The company at present is operating a small plant at Osage, Wyo.

The new plant will have a capacity of 1,000 bbls. daily and will operate with Colorado crude oil. Orders for part of the material have been placed.

Manufacture of Natural Gasoline

Interpret Points of Residue Gas Curve Now in Use

To facilitate the ready interpretation of the standard residue gas curve in terms of per cent of casinghead gas returnable as residue after extraction and plant use, the Natural Gasoline Association of America adopted on February 9 a table of relationships. While the table of values included here has been adopted for general use, and the information was derived from the standard curve, it is intended that the table be used only to interpret the points on the curve and in case of an argument the curve itself stands as the basis for settling the dispute.

PER CENT OF CASINGHEAD GAS RETURNABLE AS RESIDUE AFTER EXTRACTION AND PLANT USE AS SHOWN BY NATURAL GASOLINE ASSOCIATION OF AMERICA RESIDUE GAS CURVE.

G.P.M.—	% Ret.	G.P.M.—	% Ret.
.00	0	9.30	17.30
.05	93.10	9.35	17.05
.10	92.60	9.40	16.80
.15	92.10	9.45	16.50
.20	91.60	9.50	16.20
.25	91.05	9.55	16.00
.30	90.50	9.60	15.80
.35	90.05	9.65	15.58
.40	89.60	9.70	15.20
.45	89.00	9.75	14.95
.50	88.40	9.80	14.70
.55	87.85	9.85	14.45
.60	87.30	9.90	14.20
.65	86.80	9.95	13.95
.70	86.30	10.00	13.79
.75	85.75	10.05	13.35
.80	85.20	10.10	13.00
.85	84.70	10.15	12.75
.90	84.20	10.20	12.50
.95	83.65	10.25	12.25
1.00	83.10	10.30	12.00
1.05	82.50	10.35	11.75
1.10	81.90	10.40	11.50
1.15	81.40	10.45	11.25
1.20	80.90	10.50	11.00
1.25	80.40	10.55	10.75
1.30	79.90	10.60	10.50
1.35	79.45	10.65	10.25
1.40	79.00	10.70	10.00
1.45	78.50	10.75	9.75
1.50	78.00	10.80	9.50
1.55	77.50	10.85	9.25
1.60	77.00	10.90	9.00
1.65	76.50	10.95	8.75
1.70	76.00	11.00	8.50
1.75	75.50	11.05	8.25
1.80	75.00	11.10	8.00
1.85	74.50	11.15	7.70
1.90	74.00	11.20	7.40
1.95	73.45	11.25	7.20
2.00	72.90	11.30	7.00
2.05	72.45	11.35	6.75
2.10	72.00	11.40	6.50
2.15	71.50	11.45	6.25
2.20	71.00	11.50	6.00
2.25	70.50	11.55	5.80
2.30	70.10	11.60	5.60
2.35	69.60	11.65	5.25
2.40	69.10	11.70	5.10
2.45	68.65	11.75	4.85
2.50	68.20	11.80	4.60
2.55	67.70	11.85	4.35
2.60	67.20	11.90	4.10
2.65	66.70	11.95	3.80
2.70	66.20	12.00	3.50
2.75	65.75	12.05	3.25
2.80	65.30	12.10	3.00
2.85	64.90	12.15	2.75
2.90	64.50	12.20	2.50
2.95	63.95	12.25	2.30
3.00	63.40	12.30	2.10
3.05	62.95	12.35	1.85
3.10	62.50	12.40	1.60
3.15	62.00	12.45	1.40
3.20	61.50	12.50	1.20
3.25	61.00	12.55	.90
3.30	60.50	12.60	.60
3.35	60.15	12.65	.35
3.40	59.80	12.70	.10
3.45	59.30	12.75	—.20
3.50	58.80	12.80	—.50
3.55	58.35	12.85	—.75
3.60	57.90	12.90	—1.00
3.65	57.40	12.95	—1.20
3.70	56.90	13.00	—1.40
3.75	56.55	13.05	—1.65
3.80	56.20	13.10	—1.90
3.85	55.75	13.15	—2.15
3.90	55.30	13.20	—2.40
3.95	54.80	13.25	—2.60
4.00	54.30	13.30	—2.80
4.05	53.85	13.35	—3.05
4.10	53.40	13.40	—3.30
4.15	52.95	13.45	—3.55
4.20	52.50	13.50	—3.80
4.25	52.15	13.55	—4.00
4.30	51.80	13.60	—4.20
4.35	51.30	13.65	—4.45
4.40	50.80	13.70	—4.70
4.45	50.40	13.75	—4.95
4.50	50.00	13.80	—5.20
4.55	49.65	13.85	—5.55
4.60	49.30	13.90	—5.90
4.65	48.85	13.95	—6.05
4.70	48.40	14.00	—6.20
4.75	47.95	14.05	—6.40
4.80	47.50	14.10	—6.60
4.85	47.15	14.15	—6.80
4.90	46.80	14.20	—7.00
4.95	46.35	14.25	—7.30
5.00	45.90	14.30	—7.60
5.05	45.50	14.35	—7.85
5.10	45.10	14.40	—8.10
5.15	44.75	14.45	—8.35
5.20	44.20	14.50	—8.60
5.25	43.85	14.55	—8.85
5.30	43.50	14.60	—9.10
5.35	43.05	14.65	—9.30
5.40	42.60	14.70	—9.50
5.45	42.25	14.75	—9.75
5.50	41.90	14.80	—10.00
5.55	41.55	14.85	—10.20
5.60	41.20	14.90	—10.40
5.65	40.80	14.95	—10.60
5.70	40.40	15.00	—10.80
5.75	40.15	15.05	—11.00
5.80	39.80	15.10	—11.20
5.85	39.50	15.15	—11.40
5.90	39.10	15.20	—11.60
5.95	38.70	15.25	—11.85
6.00	38.30	15.30	—12.11
6.05	37.90	15.35	—12.40
6.10	37.50	15.40	—12.70
6.15	37.20	15.45	—12.90
6.20	36.90	15.50	—13.10
6.25	36.55	15.55	—13.30
6.30	36.20	15.60	—13.50
6.35	35.80	15.65	—13.75
6.40	35.40	15.70	—14.00
6.45	35.10	15.75	—14.20
6.50	34.80	15.80	—14.40
6.55	34.45	15.85	—14.65
6.60	34.10	15.90	—14.90
6.65	33.80	15.95	—15.10
6.70	33.50	16.00	—15.30
6.75	33.15	16.05	—15.55
6.80	32.80	16.10	—15.80
6.85	32.50	16.15	—16.05
6.90	32.20	16.20	—16.30
6.95	31.85	16.25	—16.55
7.00	31.50	16.30	—16.80
7.05	31.15	16.35	—17.00
7.10	30.80	16.40	—17.20
7.15	30.50	16.45	—17.30
7.20	30.20	16.50	—17.40
7.25	29.85	16.55	—17.60
7.30	29.50	16.60	—17.80
7.35	29.25	16.65	—18.05
7.40	29.00	16.70	—18.30
7.45	28.65	16.75	—18.55
7.50	28.30	16.80	—18.80
7.55	28.00	16.85	—19.00
7.60	27.70	16.90	—19.20
7.65	27.30	16.95	—19.35
7.70	26.90	17.00	—19.50
7.75	26.70	17.05	—19.75
7.80	26.50	17.10	—20.00
7.85	26.30	17.15	—20.25
7.90	25.90	17.20	—20.50

CALIFORNIA ADDS TO NATURAL GASOLINE STOCKS IN DECEMBER

California added to its natural gasoline stocks in December and the quantity was much greater than that of the previous month. During December the stocks of natural gasoline were increased 66,535 bbls. to a total of 1,818,088 bbls. The daily average production at plants decreased from 40,263 to 39,090 bbls., but there was a lesser consumption of the product by refiners. A total of 28,182 bbls. were consumed by refiners in December while in November these refiners utilized 26,195 bbls. daily. Total exports of natural gasoline increased materially but intercoastal shipments declined enough to offset the increased exports.

The detailed tabulation of data covering the months of November and December is shown below:

CALIFORNIA NATURAL GASOLINE STATISTICS FOR DECEMBER

	Daily aver. (bbls.) December	Daily aver. (bbls.) November
Total production, including fuel used on leases	39,814	40,633
Stock transferred (delivered), receipts, net	724	370
Total	39,090	40,263
DEDUCT refinery requirements:		
Run to stills	2,505	2,704
Blended	23,690	25,478
Total	26,195	28,182
Gains (losses) unaccounted for, net	1,414	1,771
Net supply available to market	11,481	10,310
DEMAND:		
Domestic consumption, including bunkers	432	.....
Pacific foreign exports	1,261	338
Atlantic foreign exports	5,301	.....
Intercoastal shipments	2,340	9,381
Total market demand	9,335	9,719
Surplus or (deficit)	2,146	591
STOCKS—last day of period:		
Total stocks	1,884,623	1,818,088
Inside Pacific Coast territory: At refineries	1,425,858	1,500,256
Elsewhere	458,765	317,832
Inside Pacific Coast territory—last day	1,884,623	1,818,088
Inside Pacific Coast territory—first day	1,818,088	1,800,378
Increase or (decrease) during the period	66,535	17,710

Operation of Natural Gasoline Plants

Number of plants operating..... 122 Daily capacity, thou. of cu. ft..... 2,471,813

Production by Fields

	Gas treated (thousand cu. ft.)	Natural gasoline produced (gallons)
Fullerton and Whittier	641,419	1,472,610
Midway	1,755,897	2,944,964
Huntington Beach	502,831	1,552,214
Kettleman Hills	11,549,399	14,062,037
Long Beach	4,414,769	9,557,190
Richfield	427,446	529,246
Santa Fe Springs	6,316,353	9,146,821
Seal Beach	580,545	963,666
Ventura Avenue	4,739,256	4,392,987
All other fields	4,944,907	7,216,415
Total	35,922,822	51,838,150

Production by Methods

Type of plant—	Gas treated M.C.F.	Nat. gasoline produced (gallons)	Gasoline recovery per M.C.F. gas treated
Oil absorption	35,757,566	51,653,526	1.445
Compressor	165,256	184,624	1.117
Total	35,922,822	51,838,150	1.443

Finished gasoline produced at plants, bbls. 188

Stocks—	Gallons	Barrels
Natural gasoline held by plant operators	7,069,478	168,321
Nautral gasoline held by refineries	72,084,684	1,716,302
Total	79,154,162	1,884,623

FUEL LINES IN 1932 CARS BETTER LOCATED

Car manufacturers have paid considerably more attention to "vapor locking" in designing the 1932 models. The great majority of cars now being offered show a definite shift in the location of the main fuel line, the location of the fuel pump or a relocation of the exhaust pipe together with a rather extensive use of insulation.

The following table shows the manner in which some of the more important car manufacturers have handled the problem of avoiding vapor lock. Type of car, location of exhaust and location of main fuel line are as follows: Buick—left, front; right, outside frame. Cadillac—right and left front; left, outside frame. Chevrolet—left, center; right, inside frame. Chrysler, Imp.—right, center; right, outside frame. Dodge Six—right, rear; right, inside frame. Dodge Eight—right, center; right, outside frame. Essex—right, rear; left, outside frame. Lincoln—left, front; right, inside frame. Plymouth—right, front; right, outside frame. Pontiac Six—right, rear; right, outside frame. Studebaker Eight—right, front; right, inside frame.

In addition to the care taken in locating the fuel line with respect to the exhaust piping, several cars as in the case of the Hupmobile, Auburn and Nash, heavily lag the exhaust manifold and piping under the hood. Another common practice of insulating the carburetor is by the use of insulating gaskets between the carburetor and the intake manifold flange.

TO BUILD BUTANE-AIR PLANT SOUTHERN UTAH

LOS ANGELES, Calif., Feb. 20.—Another air-butane gas plant will be built in Utah in the near future to utilize liquefied gases manufactured in California. This plant will be located in Cedar City, the first plant to be built in southwestern Utah. David M. Ward, of Eagle Rock, consulting engineer, plans to start construction of a plant this spring and to put it in operation during the summer. Cedar City has a population of about 3,000 people and is the terminus of a branch of the Union Pacific. It is also the site of a refinery built and operated largely by California capital which runs oil from the Virgin Field in Washington County, 50 miles to the south.

Mr. Ward has signed up some 500 subscribers for the gas service. He is building the plant as a personal unincorporated venture. If successful he may install similar plants in other Utah communities. The nearest gas service at present is at Las Vegas, Nev., distant about 150 miles.

STANDARD OF CALIFORNIA BUILDS BUTANE-AIR UNIT

The Standard Oil Co. of California, through its subsidiary, the Natural Gas Corp. of California, has completed construction work on its new air-butane gas plant in the Imperial Valley. The new plant will replace the artificial gas plant formerly in use there. Approximately 1,600 meters have been set but the great bulk of the gas consumption is in the cooler months as during the summer many of the residents move to higher points.

ANOTHER EAST TEXAS PLANT

H. H. Adams, of Fort Worth, Tex., is moving a small natural gasoline plant from the Santa Anna area near Coleman, Tex., to a location near Kilgore in the East Texas Field.

(Continued on Page 95)

There are 4 Variables in Refinery Problems

1. TEMPERATURE
2. PRESSURE
3. LEVEL
4. FLOW

● Accurate control of temperature is the first objective but satisfactory Results depend on the close control of all four. In fact, the control of temperature itself often depends on how the other variables are controlled.

● Foxboro has the Engineers, the Experience and the Instruments necessary to solve every refinery problem in control of Temperature, Pressure, Flow and Level. Send us the complete details of your problem.

● *To solve any refinery control problem wide experience is necessary in controlling all four variables. Given the opportunity to engineer the complete control equipment on any refinery unit Foxboro will guarantee satisfactory Results.*

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Portland, Ore. Detroit Salt Lake City
Agents for Robinson Patented Orifice Flange Fittings

● ● Guaranteed Refinery Control Results ● ●

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINES

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
*U. S. Motor	.02¾	.03½	.02⅞	.03½
60-62 400	.03	.03⅛	.03⅛	.03¼
64-66 390	.03⅜	.03½	.03⅜	.03½
64-66 375	.03⅝	.03⅞	.03⅝	.03⅞
68-70 350	.03¾	.04	.03¾	.04
NORTH TEXAS—				
*U. S. Motor	.02⅞	.03	.03	
60-62 400	.03⅛	.03¼	.03⅛	.03¼
64-66 390	.03⅜	.03½	.03⅜	.03½
64-66 375	.03⅝	.03⅞	.03⅝	.03⅞
64-66 360	.03¾	.04	.03¾	.04
‡NORTH LOUISIANA—				
*U. S. Motor	.03¼	.03½	.03½	.03¾
60-62 400	.03½		.03¾	
‡ARKANSAS—				
*U. S. Motor	.03¼	.03½	.03¼	.03½
CHICAGO Based on Okla. (Group 3)—				
*U. S. Motor	.02¾	.03	.02¾	.03
60-62 400	.03	.03¼	.03	.03¼
64-66 375	.03⅝	.04	.03⅝	.04
Aviation fighting grade	.04½	.05	.04½	.05
68-70 360	.04	.04¼	.04	.04¼

Octane Ratings—Above quotations cover price ranges on gasolines in which no octane rating is given. In the case of the U. S. Motor and 60-62 400 endpoint grades where an octane rating of 57-65, inclusive, is guaranteed, prices are one-half cent per gallon higher than quotations shown in above tables; where an octane rating of 65 or higher is guaranteed, the prices are three-fourths cent higher. In the case of the remaining grades, gasolines of 65 octane rating or higher are quoted one-fourth cent higher than the quotations shown in above tables. Unless otherwise provided by agreement of buyers and sellers, the Series 30 testing equipment of the Ethyl Gasoline Corp. is recognized as standard in determining octane ratings.

*Present distillation specifications on U. S. Motor gasoline are: 10 per cent evaporated, 167° F. maximum; 50 per cent, 284° F. maximum; 90 per cent, 392° F. maximum; residue not exceeding 2 per cent; maximum vapor pressure, 12 pounds. Additional specification on U. S. Motor gasoline available from bulletins of Bureau of Mines, Washington, D. C.

‡For Arkansas, Louisiana and Mississippi delivery.

PENNSYLVANIA (Inland refineries)—				
U. S. Motor	.04	.04½	.04	.04½
60-62 400	.04⅜	.04⅝	.04⅜	.04⅝
64-66 375	.04¾	.05	.04¾	.05
68-70 350	.05½		.05½	

Octane Ratings—In the case of U. S. Motor and 60-62 400 endpoint grades, same price differentials based on octane ratings as shown in above tables for Oklahoma and other Mid-Continent areas.

CALIFORNIA (domestic movement only)—				
54-58 U. S. Motor	.04½	.05	.04½	.05
58-60 400	.05	.05½	.05	.05½
NEW YORK (Bayonne, N. J.)—				
U. S. Motor, below 65 octane number	.05¾		.05¾	
U. S. Motor, min. 65 octane	.06½		.06½	

NAPHTHAS

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
50-52 450 (blending)	.02¾	.03	.02¾	.03
PENNSYLVANIA—				
50-54 430-450 (blending)	.04		.04	
ARKANSAS—				
48-50 450 (blending)	.03		.03	
CHICAGO Based on Okla. (Group 3)—				
50-52 450 (blending)	.02¾	.02⅞	.02¾	.02⅞
Cleaners' naphtha, 56-58 gr. 200 i.b.p.-320 e.p.	.05⅝	.05⅞	.05⅝	.05⅞
Lacquer diluent, 180 i.b.p.-250 e.p.	.09	.09¼	.09	.09¼
Lacquer diluent, 140 i.b.p.-200 e.p.	.09	.09¼	.09	.09¼
Rubber solvent, 68-70 gr., 100 i.b.p.-300 e.p.	.05¾	.06¼	.05¾	.06¼
Stoddard solvent, 300 i.b.p.-410 e.p., over 100° flash	.04⅞	.05⅛	.04⅞	.05⅛
Pet. thinner, 290, 300 i.b.p.-415 e.p., over 83° flash	.04⅜	.04⅝	.04⅜	.04⅝
V.M.&P. naphtha, 56-58 gr., 190-200 i.b.p.-330 e.p.	.05¼	.05½	.05¼	.05½
Petroleum spirits	.03⅞	.04¼	.03⅞	.04¼

NATURAL GASOLINES

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
Grade 18-55	.01⅞	.02⅛	.01⅞	.02⅛
Grade 26-70	.01⅝	.01½	.01⅝	.01½
Grade 30-70	.01¼		.01¼	
NORTH TEXAS—				
Grade 18-55	.01⅞	.02	.01⅞	.02
Grade 26-70	.01⅝		.01⅝	
Grade 30-70	.01¼		.01¼	
NORTH LOUISIANA—				
Grade 26-70	.01¾		.01¾	
CALIFORNIA—				
75-78 375	.04¼	.05	.04¼	.05

Note—Grades 18-55, 26-70 and 30-70 are three of 24 grades adopted by the Natural Gasoline Association of America effective January 1. The grades are based on pounds vapor pressure and amount evaporated at 140° F. See page 74 of January 7 issue for explanation of new grading system. While not exactly the same specifications apply, Grade 18-55 corresponds to the former Grade A; Grade 26-70 to former Grade AA and Grade 30-70 to former Grade BB.

KEROSENES

(All kerosenes water white)

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
41-43	.02⅝	.02¾	.02⅝	.02¾
42-44	.02¾	.02⅞	.02¾	.02⅞
NORTH TEXAS—				
40-41	.02⅝		.02⅝	
41-43	.02¾		.02¾	
‡NORTH LOUISIANA—				
41-43	.03	.03¼	.03	.03¼
42-44	.03¼	.03⅜	.03¼	.03⅜
‡ARKANSAS—				
41-43	.03	.03¼	.03	.03¼
PENNSYLVANIA—				
45	.04⅛	.04¼	.04⅛	.04¼
46	.04½	.04⅝	.04½	.04⅝
47	.04⅝	.04¾	.04⅝	.04¾
CHICAGO (Based on Group 3)—				
41-43	.02½	.02⅝	.02½	.02⅝
42-44	.02⅝	.02¾	.02⅝	.02¾
***CALIFORNIA—**				
38-40 high burning test	.03¾	.04½	.03¾	.04½
NEW YORK (Bayonne, N. J.)—				
41-43	.05½	.05¾	.05½	.05¾

*For Pacific Coast consumption.

‡For Arkansas, Louisiana and Mississippi delivery.

TRACTOR FUELS*

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
39-41 prime white	.02¼		.02¼	
38-40 light straw	.02	.02⅛	.02	.02⅛
NORTH TEXAS—				
38-40 light straw	.02	.02⅛	.02	.02⅛
CHICAGO (Based Group 3)—				
38-40 light straw	.02⅛	.02¼	.02⅛	.02¼
PENNSYLVANIA—				
41-43 prime white	.04⅛	.04¼	.04⅛	.04¼

*There are no standard specifications for tractor fuels. Grades commonly sold have flash under 175° F. (open cup) and under 575° F. endpoint and less than .2 per cent sulphur. Tractor fuels are available from all Mid-Continent refining groups at prices in line with the Oklahoma market taking into consideration differentials in freight rates.

FURNACE OILS*

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
32-36 straw	.01¾	.01⅞	.01¾	.01⅞
36-38 straw	.01⅞	.02	.01⅞	.02
38-40 straw	.02	.02⅛	.02	.02⅛
39-41 prime white	.02⅛	.02¼	.02⅛	.02¼
NORTH TEXAS—				
38-40 straw	.02⅛	.02¼	.02⅛	.02¼
‡NORTH LOUISIANA—				
36-40	.02¼	.02½	02¼	.02½
‡ARKANSAS—				
32-36	.02	.02¼	.02	.02¼
CHICAGO (Based on Group 3)—				
32-36 straw	.01⅞	.02	.01¾	.02
38-40 straw	.02	.02⅛	.02	.02⅛
PENNSYLVANIA—				
40-41 prime white	.03½		.03½	
NEW YORK (Bayonne, N. J.)—				
32-36	.03½		.03½	
36-40	.03¾		.03¾	

*Above prices are for furnace oils of zero cold test, under 190° F. flash and good odor.

‡For Arkansas, Louisiana and Mississippi delivery.

GAS OIL, DIESEL OIL AND FUEL OIL

Gas oil (G.O.) quoted per gallon basis; Diesel oil and fuel oil per barrel.

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
32-36 (G.O.) cracking stock	.01	.01⅛	.01	.01⅛
U.G.I. (G.O.)	.01	.01⅛	.01	.01⅛
32-36, zero to 15 (G.O.) high flash	.01¼	.01⅜	.01¼	.01⅜
28-30, zero to 10	.45	.50	.45	.50
26-30, zero to 10	.40	.50	.40	.50
24-26	.35	.40	.35	.40
20-22	.25	.30	.25	.30
16-20	.22½	.27½	.22½	.27½
Below 16	.22½	.25	.22½	.25
NORTH TEXAS—				
32-36 (G.O.) industrial	.01⅛		.01⅛	
22-26	.40	.45	.40	.45
Below 20	.30	.35	.30	.35
‡NORTH LOUISIANA—				
30-32 (G.O.) zero	.02	.02¼	.02	.02¼
18-22	.30	.40	.30	.40
‡ARKANSAS—				
28-32 (G.O.) zero	.50	.60	.50	.60
16-20	.40	.45	.40	.45
CHICAGO (Based on Group 3)—				
32-36 (G.O.) industrial	.01⅛	.01¼	.01⅛	.01¼
28-30 (zero)	.55	.60	.55	.60
22-26	.32½	.37½	.32½	.37½
18-22	.25	.30	.25	.30
Below 18	.20	.25	.20	.25

Note—Fuel oils of more than 40 cold test generally 5 to 10 cents per barrel less in all areas than shown in above tables.

‡For Louisiana, Arkansas and Mississippi delivery.

CALIFORNIA—				
30-34 (G.O.) per bbl.	.85	1.00	.85	1.00
27 plus Diesel	.80	.90	.80	.90
15-19 bunker (at tidewater)	.60	.80	.60	.80
15-19 bunker (cargo lots)	.55	.75	.55	.75
15-19 (tank cars)	.45	.75	.45	.75
GULF COAST—				
28-30 (G.O.)	.02½	.02¾	.02½	.02¾
Bunker C (cargo lots)	.40	.50	.40	.50
NEW YORK (Bayonne, N. J.)—				
28 plus (G.O.)	.03½	.04	.03½	.04
*28-30 Diesel	1.30		1.30	
†Bunker C	.60		.60	

*Lighterage 6½ cents per barrel.

†Lighterage 5 cents per barrel.

PETROLEUM COKE*

Prices per ton f.o.b. refineries in Chicago area.

	Feb. 23		Feb. 16	
Breeze (screenings)	3.75		3.75	
Still runs	4.75		4.75	
Lump and egg	7.00	7.50	7.00	7.50

*Refiners will absorb freight up to 80 cents a ton.

NEUTRAL OILS

(Viscosity at 100° F., and Color)

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
Zero to 10 Cold Test:				
150-3	.06¼	.06½	.06¼	.06½
180-3	.07½	.07¾	.07½	.07¾
180-4	.07	.07¼	.07	.07¼
200-3	.08½		.08½	
200-4	.08	.08¼	.08	.08¼
240-3	.09¾	.10	.09¾	.10
240-4	.09¼	.09½	.09¼	.09½
280-3	.11¼	.11½	.11¼	.11½
280-4	.10¼	.10½	.10¼	.10½
300-3.5	.11¾	.12	.11¾	.12
350-3.5	.12¼	.12½	.12¼	.12½
400-4	.12¾	.13	.12¾	.13
500-4.5	.13¼	.13½	.13¼	.13½
100-2 Paraffin Oil	.04¼	.04½	.04¼	.04½
15-30 Cold Test:				
200-3	.07¾	.08	.07¾	.08
200-4	.07½	.07¾	.07½	.07¾
240-3	.09¼	.09½	.09¼	.09½
240-4	.08¾	.09	.08¾	.09
280-3	.10¾	.11	.10¾	.11
280-4	.09¾	.10	.09¾	.10
PENNSYLVANIA—				
Viscosity at 70° F., and Color:				
150-3	.13	.13½	.13	.13½
180-3	.16	.17	.16	.17
200-3	.18	.18½	.18	.18½
220-3	.21	.21½	.21	.21½
36 Miners Neutral	.05½		.05½	
34 Neutral	.05½		.05½	
34 Sundebloom Neutral	.05		.05	
GULF COAST—				
Pale Oils:				
100-2-2½	.05	.05½	.05	.05½
200-3	.07	.07½	.07	.07½
300-3	.07¾	.08	.07¾	.08
500-3½	.09	.09½	.09	.09½
750-3½	.10	.10¼	.10	.10¼
1,200-3½	.12	.12¼	.12	.12¼
2,000-4	.14	.14½	.14	.14½
Red Oils:				
200-5-6	.06	.06¼	.06	.06¼
300-5-6	.06¾	.07	.06¾	.07
500-5-6	.08	.08¼	.08	.08¼
1,200-5-6	.11	.11¼	.11	.11¼
2,000-6 plus	.13	.13¼	.13	.13¼
CALIFORNIA—				
Pale Oils:				
100-2½-3	.08	.08¼	.08¼	.08¾
200-2½-3	.08	.08¼	.09¼	.10¼
300-3-3½	.08½	.08¾	.10¼	.11¼
350-3-4	.09	.09¼	.11¼	.12
400-3-4	.09½	.09¾		
450-3-4	.10	.10¼	.12	.12¾
550-3-4	.10½	.11	.12¾	.13¾
Red Oils:				
200-4½-5	.08	.08¼	.09¾	
300-5-6	.08½	.08¾	.10½	.11
350-5-6	.09	.09¼		
400-5-6	.09½	.09¾	.11½	.12½
450-5-6	.10	1.0¼		
500-5-6	.10½	.11	.12¾	.13½
600-5-6½	.11½	.12	.13½	.14¼
700-6½ plus	.12½	.12¾	.14½	.15¼
750-6½ plus	.13	.13½		
900-6½ plus	.14½	.14¾		
NEW YORK (Bayonne, N. J.)—				
Paraffin Oil:				
25 pale	.10¼		.10¼	
28 pale	.07¼		.07¼	
280 red	.12½		.12½	

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

250 red	.11½		.11½	
225 red	.10		.10	
200 red	.09¼		.09¼	

BRIGHT STOCKS AND STEAM REFINED STOCKS

OKLAHOMA (Group 3)—	Feb. 23		Feb. 16	
600 light green S.R.	.04	.06	.04	.06
600 dark green S.R.	.03	.04½	.03	.04½
Bright Stock:				
190-200 D	.18½		.18½	
150-160 D, 0-10	.16	.16½	.16	.16½
150-160 D, 10-25	.15½	.16	.15½	.16
150-160 D, 25-40	.15	.15½	.15	.15½
150-160 E	.15		.15	
PENNSYLVANIA—				
600 S.R.	.11	.12	.11	.12
650 S.R.	.14¼	.14½	.14¼	.14½
600 Pennsylvania flash	.15	.16	.15	.16
600 E filtered	.14	.15	.14	.15
600 D filtered	.18	.18½	.18	.18½
Pennsylvania Grade Bright Stock:				
10-15 pour test	.23		.23	
25-30 pour test	.20½	.21	.20½	.21
35 and above	.20	.20½	.20	.20½

WAX AND PETROLATUM

(Prices per pound)

OKLAHOMA (Group 3)—	Feb. 23	Feb. 16
124-126 white crude scale	.01¾	.01¾
PENNSYLVANIA—		
At New York:		
122-124	.02⅛	.02⅛
124-126	.02⅛	.02⅛
NEW YORK (Bayonne, N. J.)—		
Refined Wax:		
120-122	.02⅝	.02⅝
125-127	.02⅞	.02⅞
130-132	.03⅜	.03⅝
133-135	.04	.03¾
135-137	.04⅛	.04⅛
Petrolatum in barrels in carload lots:		
Dark green	.01¾	.01¾
Amber	.02¼	.02¼
Extra amber	.02⅝	.02⅝
Cream	.04¾	.04¾
Lily white	.05¾	.05¾
Snow white	.06¾	.06¾

EXPORT PRICES

GASOLINE

GULF COAST—	Feb. 23	Feb. 16
U. S. Motor	.04½	.04½

60-62 400 endpoint	.04⅝		.04⅝	
61-63 390 endpoint	.04⅝		.04⅝	
64-66 375 endpoint	.04⅞	.04¾	.04¾	
LOS ANGELES, CALIF.—				
U. S. Motor, 53-55 437 e.p.	.04	.04½	.04	.04½
U. S. Motor, 65 octane num.	.05		.05	
U. S. Motor, 67 octane num.	.05¼		.05¼	
U. S. Motor, 69 octane num.	.05½		.05½	
58-62 400 endpoint gasoline	.04½		.04½	

KEROSENE

GULF COAST—				
41-43 prime white	.04¼		.04¼	
41 water white	.04½		.04½	
LOS ANGELES, CALIF.—				
41-43 water white	.04	.04¾	.04	.04¾

LUBRICANTS

NEW YORK (Bayonne, N. J.)—				
600, steam refined cylinder stocks, in bbls.	.19	.20	.19	.20
650, steam refined	.22½	.23	.22½	.23
600, Pennsylvania flash	.23	.24	.23	.24
630, Pennsylvania flash	.26	.27	.26	.27
600, Warren E	.22½	.23	.22½	.23
600, Oil City E	.21½	.22	.21½	.22
Light 140-150 Bright Stocks	.28	.29	.27	.28
Dark 140-150 Bright Stocks	.27	.28	.26	.27

CALIFORNIA CRUDE OIL PRICES

STANDARD OIL CO. OF CALIFORNIA

For its current purchases of crude oil at the well (unless otherwise specified) for allowable crude oil produced in accordance with allocations made by the California Statewide Curtailment Committee. All gravities above those quoted take highest price offered in that field. Effective June 19, 1931, at 7 a.m.

Gravity	Signal Hill	Seal Beach, Alamitos Heights	Huntington Beach	Inglewood	Olinda-Brea, Canon	Torrance	Richfield	Coyote Hills	Santa Fe Springs	Midway-Sunset, Elk Hills Buena Vista Hills	Lost Hills
14-14.9	$.65	$.65	$.65	$.65	$.65	$.65	$.65	$.65	...	$.55	$.55
15-15.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
16-16.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
17-17.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
18-18.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
19-19.9	.65	.65	.65	.65	.65	.65	.65	.65	...	.55	.55
20-20.9	.65	.65	.65	.66	.66	.65	.65	.65	...	.55	.55
21-21.9	.65	.65	.65	.68	.67	.65	.66	.65	...	.55	.57
22-22.9	.65	.65	.66	.70	.68	.66	.68	.65	...	.56	.59
23-23.9	.67	.67	.68	.72	.70	.67	.70	.66	...	.58	.60
24-24.9	.69	.69	.70	.74	.72	.68	.72	.67	$.65	.61	.62
25-25.9	.71	.71	.72	.76	.74	.70	.74	.69	.65	.64	.64
26-26.9	.73	.73	.74	...	.76	...	...	.71	.65	.66	.65
27-27.9	.75	.75	.76	...	.78	...	...	.73	.68	.68	.67
28-28.9	.77	...	...	...	.80	...	...	.75	.71	.71	.69
29-29.9	.79	...	...	...	...	...	...	.77	.73	.74	.71
30-30.9	.81	...	...	...	...	...	...	.79	.75	.76	.72
31-31.9	...	...	...	...	...	...	...	...	.78	...	...
32-32.9	...	...	...	...	...	...	...	...	.80	...	...
33-33.9	...	...	...	...	...	...	...	...	.83	...	...
34-34.9	...	...	...	...	...	...	...	...	.85	...	...
35-35.9	...	...	...	...	...	...	...	...	.87	...	...

Standard Oil Co. of California prices in other fields:

Wheeler Ridge—55 cents per barrel for all grades (14° to 25.9°).

Coalinga—55 cents for all grades from 14° to 24-24.9°; 57 cents for 25 gravity.

Newhall, McKittrick and Kern River—55 cents for all grades (14° to 19.9°).

Montebello—65 cents for all grades (14° to 25.9°).

Whittier and LaHabra—65 cents for all grades (14° to 22.9°).

Elwood Terrace, f.o.b. ship—33° to 33.9°, 79 cents; 34° to 34.9°, 81 cents; 35° to 35.9°, 84 cents; 36° and above, 87 cents.

Playa Del Rey—Prices subject to field gathering charge of 5 cents per barrel—19° to 19.9°, 65 cents; 20° to 20.9°, 65 cents; 21° to 21.9°, 66 cents; 22° to 22.9°, 67 cents; 23° to 23.9°, 68 cents; 24° to 24.9°, 67 cents; 25° and above, 68 cents.

(Continued on Page 94)

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

East Texas (Nov. 2, 1931)† ..... $ .83
Corsicana heavy (Nov. 2, 1931)* ..... .49
Other fields..... See gravity table

†Posted by Panola Pipe Line Co., Magnolia Petroleum Co., Tidal Refining Co., Sinclair Refining Co., Gulf Pipe Line Co., Atlas Pipe Line Co. *Magnolia Petroleum Co.

EASTERN STATES

Joseph Seep Purchasing Agency
(Effective December 16, 1931)

Pennsylvania Grade Oil in National Transit Lines (Bradford Field) $1.85
Pennsylvania Grade Oil in Southwest Pennsylvania Lines 1.55
Penna Grade Oil in Eureka Pipe Line Lines (West Virginia) 1.45
Penna Grade Oil in Buckeye Pipe Line Lines 1.35
Corning Grade Oil in Buckeye Pipe Line Co.'s line (Nov. 9, 1931) ..... .85
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky) (Jan. 10, 1931) ... .60
Wayne district Oil in Cumberland Pipe Lines (April 23, 1931) 1.17

Tide Water Pipe Co.
(Effective December 16, 1931)

Bradford, Pa. $1.85
Allegany, N. Y. 1.85

Pure Oil Co.
(Effective December 16, 1931)

Cabin Creek, W. Va. $1.45
Bradford Hollow, W. Va. 1.45
Kelly's Creek, W. Va. 1.45

Pennzoil Co.
(Effective December 16, 1931)

Pennsylvania Grade Oil in National Transit Lines:
Group A $1.80
Includes Cochran, Franklin, Hamilton and Doolittle districts.
Group B $1.79
Includes Titusville district.
Group C $1.78
Includes Turkey and Tidiout districts.
Group D $1.77
Includes Bear Creek and Porkey districts.
Group E $1.75
Includes Eldenau, Bull Creek, Rough Run, Carbon, Dipner, Bredin, McJunkin, Jameson, Kennerdell, Emienton, Tiona, Lacy and Kinzua districts.
Price depends on length of pipe line haul to plant at Oil City.

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchison Counties.....See gravity table

ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.

Iles, light (Aug. 24, 1931) ..... $ .75
Iles, heavy (Aug. 24, 1931) ..... .53
Fort Collins (Nov. 3, 1931) ..... .71
Florence (Nov. 2, 1931) ..... .65
Wellington (Nov. 3, 1931) ..... .61
Dutton Creek (Nov. 3, 1931) ..... .75
Rock Creek, Wyo. (Nov. 3, 1931) ..... .85
Frannie, light (Nov. 3, 1931) ..... .61
Frannie, heavy (Nov. 3, 1931) ..... .51
Salt Creek.....Mid-Continent gravity table
Big Muddy (Nov. 3, 1931) ..... .83
Grass Creek (Nov. 3, 1931) 1.05
Elk Basin (Nov. 3, 1931) 1.05
Lance Creek (Aug. 24, 1931) 1.05
Poison Spider (Mar. 5, 1931) ..... .70
Notches (Mar. 14, 1927) ..... .65
Hudson (June 2, 1931) ..... .65
Lander (Mar. 5, 1931) ..... .40
Rex Lake (Feb. 22, 1930) 1.10
Osage (Apr. 15, 1931) ..... .98
Lost Soldier (Nov. 3, 1931) ..... .69
Hamilton Dome (Nov. 3, 1931) ..... .45
Greybull (Nov. 3, 1931) 1.05
Cat Creek (Nov. 3, 1931) 1.05
Pondera (Nov. 3, 1931) ..... .90
Sunburst, Mont. (Nov. 3, 1931) 1.00
Hogback, N. Mex. (Aug. 24, 1931) .... .80
Lea County, N. Mex. (Nov. 3, 1931) .. .50
Border, Mont. 1.55
Red Coulee, Alberta 1.55
Dry Creek, Mont. (Aug. 24, 1931) 1.00
Maljamar (Aug. 22, 1931) 1.00
Artesia-Jackson (Nov. 3, 1931) ..... .50

Note—Salt Creek, Cat Creek, Dry Creek, Dallas-Derby, Hudson, Greybull and Hogback posted by Midwest Refining Co. and remainder by Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin. Lost Soldier posted by Producers & Refiners Corp. Artesia, Jackson and Maljamar posted by Continental Oil Co. Border and Red Coulee posted by Imperial Refining Co. Lea County posted by Humble Oil & Refining Co. Fort Collins, Wellington, Orchard, Florence, Rattlesnake and Table Mesa by Continental Oil Co. Osage posted by Arro Oil & Refining Co.

(Continued on Page 86)

CRUDE OIL GRAVITY TABLE

Gravity	Kansas and Oklahoma 1	North and Central Texas 2	East Central Texas 3	Gray County, Texas 4	Carson and Hutchinson Counties, Texas 5	Salt Creek, Wyo. 6	North Louisiana and Arkansas 7	Gulf Coast (Tex. and La.) 8	Cameron Meadows, La. 9
Below 25 degrees	...	...	...	...	...	...	...	$.70	$.60
25-25.9 degrees	...	...	...	...	...	...	...	.71	.60
26-26.9 degrees	...	...	...	...	...	...	...	.72	.61
27-27.9 degrees	...	...	...	...	...	...	...	.73	.62
28-28.9 degrees	...	...	...	...	...	...	...	.74	.63
Below 29 degrees	$.61	$.61	$.61	...	...	$.61	$.61	...	...
29-29.9 degrees	.63	.63	.63	...	...	.63	.63	.75	.64
30-30.9 degrees	.65	.65	.65	...	...	.65	.65	.76	.65
31-31.9 degrees	.67	.67	.67	...	...	.67	.67	.77	.66
32-32.9 degrees	.69	.69	.69	...	...	.69	.69	.78	.67
33-33.9 degrees	.71	.71	.71	...	...	.71	.71	.79	.68
34-34.9 degrees	.73	.73	.73	$.61	$.56	.73	.73	.80	.69
35-35.9 degrees	.75	.75	.75	.63	.58	.75	.75	.81	.70
36-36.9 degrees	.77	.77	.77	.65	.60	.77	.77	.82	.71
37-37.9 degrees	.79	.79	.79	.67	.62	.79	.79	.83	.72
38-38.9 degrees	.81	.81	.81	.69	.64	.79	.81	.84	.73
39-39.9 degrees	.83	.83	.83	.71	.66	.79	.83	.85	.74
40 degrees and over	.85	.85	.85	.73	.68	.79	.85	.86	.75

Column 1—Led by Continental Oil Co. effective November 2, 1931, and adopted on same day by other companies excepting Magnolia Petroleum Co. and White Eagle Oil Corp. and excepting that Carter Oil Co., Gypsy Oil Co. and Pure Oil Co. started their schedule at below 25 degrees, 53 cents; 25 degrees, 55 cents; with 2 cents added for each degree upward to 40 degrees and above at 85 cents. Magnolia Petroleum Co. adopted the price schedule in Oklahoma on January 8, 1932, and the White Eagle Oil Corp. in Kansas on January 1, 1932, on oil from 29 degrees upward, but posted 52 cents for oil below 28 gravity and 54 cents for 28 gravity.

Column 2—Led by Continental Oil Co. effective November 2, 1931, and followed by other purchasers on same day excepting Magnolia Petroleum Co. which met the prices on January 8, 1932, from 29 degrees upward, posting 52 cents for oil below 28 degrees and 54 cents for 28 gravity oil.

Column 3—Humble Oil & Refining Co. on November 2, and by other buyers excepting Magnolia Petroleum Co., which met the prices from 29 degrees upward on January 8, 1932, but posted 52 cents for oil below 28 degrees and 54 cents for 28 gravity oil.

Column 4—Led by The Texas Company, November 2, followed by Humble Oil & Refining Co., Gulf Pipe Line Co. and H. F. Wilcox Oil & Gas Co. same day. Magnolia Petroleum Co., January 8, 1932.

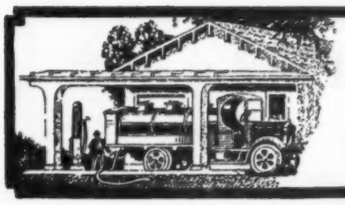
Column 5—Led by The Texas Company, November 2, followed on same day by Humble Oil & Refining Co. and Gulf Pipe Line Co. Magnolia Petroleum Co., January 8, 1932.

Column 6—Midwest Refining Co., November 2.

Column 7—Standard Oil Co. of Louisiana, November 4, 1931; The Texas Company, Gulf Refining Co. and Louisiana Oil Refining Co. same day. Magnolia Petroleum Co., January 8, 1932.

Column 8—Led by The Texas Company, November 2, followed on same day by Humble Oil & Refining Co., Vacuum Oil Co., Gulf Pipe Line Co. and Sun Oil Co., but two last named companies' schedules stop at 35 degrees and above at 81 cents, and the Sinclair Refining Co., but latter company's schedule stops at 31 degrees and above at 71 cents. Magnolia Petroleum Co. applied this schedule to Lockport and Iowa, La.

Column 9—Magnolia Petroleum Co., January 8, 1932.



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Feb. 24.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Chicago	15.0	15.0	3.0	9.0
Decatur, Ill.	15.5	15.5	3.0	9.1
E. St. Louis	14.8	14.8	3.0	8.3
Joliet	15.5	15.5	3.0	9.1
Peoria	15.5	15.5	3.0	9.1
Quincy	15.3	15.3	3.0	8.9
Davenport, Ia.	15.6	15.6	3.0	9.4
Des Moines	15.6	15.6	3.0	8.1
Keokuk	15.6	15.6	3.0	6.4
Sioux City	15.2	15.2	3.0	9.0
Duluth, Minn.	16.6	16.6	3.0	10.0
Mankato	16.2	16.2	3.0	8.1
Minneapolis	16.3	16.3	3.0	10.0
LaCross, Wis.	17.3	17.3	4.0	10.1
Milwaukee	16.2	16.2	4.0	9.0
Madison	16.4	16.4	4.0	9.2
Detroit, Mich.	14.5	14.5	3.0	9.1
Grand Rapids	15.2	14.8	3.0	10.7
Saginaw	13.2	13.2	3.0	10.5
Evansville, Ind.	16.2	15.6	4.0	10.0
Indianapolis	16.4	16.4	4.0	10.2
South Bend	16.5	16.5	4.0	8.1
Fargo, N. D.	18.0	18.0	3.0	12.0
Huron, S. D.	17.4	17.4	4.0	10.8
Sioux Falls	16.9	16.9	4.0	10.5
K. C., Mo.	15.0	15.0	3.0	7.9
Springfield*	15 0	15.0	3.0	7.0
St. Louis*	14.0	14.0	3.0	8.4
St. Joseph	14.6	14.6	3.0	7.6
Wichita, Kans.	13.9	13.9	3.0	6.1
Bartlesville, Ok.	13.1	15.1	4.0	7.1

*State tax 2 cents, remainder city tax.

A third grade of gasoline, "Stanolind Blue," is sold at all major points at a price 1¼ cents or more below the price on the regular grade.

Effective November 4—New dump discount applicable on all grades of gasoline sold from tank wagon. Any tank wagon customer buying 25 gallons or more at one time will be given 1-cent discount per gallon off tank wagon price at time of delivery. Customers not under contract receive no other discount.

Effective January 1—Discounts on Q.D.A. on 500 gallons or more per month throughout territory; Red Crown Ethyl Gasoline, 3 cents off tank wagon price; Red Crown gasoline, 2½ cents off tank wagon price; Stanolind Blue gasoline, 1 cent off tank wagon price. On deliveries of 75,000 gallons or more each classification allowed 1 cent additional discount.

Discounts on resellers authorized agent's agreement: Same amounts as above except made off service station price instead of tank wagon price.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Dallas, Tex.	15.0	16.0	4.0	9.00
Fort Worth	15.0	16.0	4.0	8.0
Houston	13.0	15.0	4.0	9.0
San Anotnio	14.0	16.0	4.0	8.0
El Paso	12.0	14.0	4.0	11.0
Texarkana	*16.0	16.0	4.0	9.0
Muskogee, Ok.	11.0	13.0	4.0	7.0
Okla. City	13.0	15.0	4.0	7.0
Tulsa	13.0	15.0	4.0	8.0
Ft. Smith, Ark.	*16 5	16 5	5.0	*11.0
Little Rock	*17.5	16.5	6.0	9.0

One-cent rebate made from posted station prices to cash purchasers in Louisiana, Arkansas and Tennessee.

*Less 2 cents to dealers.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Denver, Colo.	12.0	15.0	4.0	12.5
Pueblo	12.0	15.0	4.0	12.0
Grand Jctn.	18.0	21.0	4.0	14.5
Casper, Wyo.	15.0	18.0	4.0	10.0
Cheyenne	11.0	14.0	4.0	11.5
Butte, Mont.	17.0	20.0	5.0	16.0
Billings	20.0	23.0	5.0	14.5
Great Falls	21.0	23.0	5.0	16.0
Helena	20.0	23.0	5.0	16.0
Salt Lake, Utah	17.5	20.5	4.0	16.0
Albu'que, N. M.	17.0	20.0	6.0	14.0
Boise, Idaho	21.0	24.0	5.0	18.0
Twin Falls*	21.0	24.0	5.0	18.0

*3½-cent discount off tank wagon to dealers.

OHIO

Standard Oil Co. (Ohio)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Ohio points	15.5	16.0	4.0	*12.0

Dealers and commercial accounts 2 cents under tank wagon.

*Service station price 13 cents.

PENNSYLVANIA-DELAWARE AND PART OF NEW ENGLAND

Atlantic Refining Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Pittsburgh, Pa.	15.0	16.0	3.0	11.0
Philadelphia	14.0	15.0	3.0	11.0
Scranton	15.0	16.0	3.0	11.0
Allentown	15.0	16.0	3.0	11.0
Altoona	15.0	16.0	3.0	11.0
Erie	15.0	16.0	3.0	11.0
Dover, Del.	15.0	16.0	3.0	11.0
Wilmington	15.0	16.0	3.0	11.0
Springf'd, Mass.	15.5	16.5	3.0	8.5
Worcester	15.3	16.3	3.0	8.5
Boston	14.5	15.5	3.0	9.5
Providence, R.I.	13.5	14.5	2.0	8.5
Hartford, Conn.	14.5	15.5	2.0	10.0
New Haven	14.6	15.6	2.0	10.0

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Atlanta, Ga.*	19.5	19.5	6.0	9.0
Augusta	20.0	21.0	6.0	14.0
Macon	20.0	20.0	6.0	12.0
Savannah	19.0	19.0	6.0	11.0
Birm'ham, Ala.	20.5	20.5	6.0	10.0
Mobile	20.0	20.0	5.0	10.0
Montgomery	21.5	21.5	6.0	13.5
Jackson, Miss.	16.0	17.0	5.5	11.5
Vicksburg	18.0	16.5	5.5	8.0
Jack'ville, Fla.	19.0	19.0	7.0	11.0
Miami	21.0	22.0	7.0	13.0
Pensacola	20.0	20.0	7.0	13.0
Tampa	19.0	19.0	7.0	14.0
Lex'ngton, Ky.	17.0	18.0	5.0	10.0
Covington	16 0	17.0	5.0	10.0
Louisville	15.0	16.0	5.0	10.0
Corbin	18.0	19.0	5.0	15.0

A third grade "Kyso Green" is sold at a price generally 2 cents below the price on the regular grade.

In addition to the state tax of 4 cents on gasoline, Montgomery has city and county tax of 2 cents on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. To Pensacola, Montgomery and Birmingham state taxes add 1-cent levy tax. To Gulfport state tax add privilege tax of 2 cents. To Mobile state tax add 1-cent city tax and 2½ cents county tax.

Effective April 2 price to dealers 2 cents under posted tank wagon price.

*An additional discount of 1 cent is offered to dealers effective October 6.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Atl'tic City, N.J.	15 7	16 2	3 0	11.5
Newark	14.7	15.2	3 0	8 5
Annapolis, Md.	16 2	16.7	4 0	10.0
Baltimore	15.4	15 9	4.0	8 0
Cumberland	17 2	17.7	4 0	12 0
Wash'g'n, D. C.	13.9	14.4	2 0	10.0
Danville, Va.	18 0	18.5	5 0	11.8
Norfolk	16 5	17.0	5 0	10.3
Petersburg	17 5	18 0	5 0	11 3
Richmond	16.5	17 5	5.0	10 7
Roanoke	18.2	18.7	5.0	12 0
Charles'n, W.Va.	16.7	17 2	4.0	11 5
Parkersburg	15 4	15 9	4 0	10 2
Wheeling	16.6	17 1	4.0	11 4
Charlotte, N. C.	16 0	17 0	6 0	10.7
Hickory	19 8	20.3	6 0	12.6
Mt. Airy	19 7	20 2	6 0	12 5
Raleigh	19 4	19.9	6 0	12.2
Salisbury	19 7	20.2	6 0	12.5
Charleston, S.C.	17.5	18.0	6 0	10.3
Columbia	19.4	19 9	6 0	12 2
Spartanburg	19.7	20 2	6.0	12.5

Two and one-half cents per gallon discount off tank wagon price of gasoline to dealers except Washington, D. C., and States of Maryland and New Jersey, where discount is 3½ cents.

Prices shown above are for standard gasoline.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Albany, N. Y.	16.6	17.6	2.0	15.6
New York*	12.3	14.3	2.0	14.3
Buffalo	15.8	15.8	2.0	14.8
Rochester	16.0	16.0	2.0	14.0
Syracuse	16.8	16.8	2.0	14.8
Boston, Mass.	16.5	16.5	3.0	13.5
Augusta, Me.	18.8	18.8	4.0	14.8
Manch'tr, N. H.	18.4	18.4	4.0	14.0
Burlington, Vt.	19.3	19.3	4.0	15.3

*Prices in steel barrels.

PACIFIC COAST TERRITORY

Standard Oil Co. of California*

	Gasoline Tank truck	Gasoline Posted retail	Gasoline Incl'ds tax of	Kero. tank wagon
Fresno	12.5	14.5	3.0	17.0
San Francisco	12.5	16.5	3.0	15.5
Los Angeles	12.0	16.0	3.0	15.5
Reno, Nev.	16.0	20.0	4.0	19.0
Portland, Ore.	14.0	18.0	4.0	16.5
Seattle, Wash.	15.0	19.0	5.0	16.5
Tacoma	15.0	19.0	5.0	16.5
Spokane	18.5	22.5	5.0	20.5
Phoenix, Ariz.	14.5	17.0	5.0	20.0

Above prices are at company's plant or depots as company does not operate stations. A 4-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 1 cent.

*Retail prices posted by Standard Stations, Inc., a subsidiary.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
N. Orleans, La.	16.0	16 0	6.0	†10.0
Baton Rouge	16.5	16 5	5.0	†12.0
Alexandria	16 0	16 0	6 0	†12.0
Lafayette*	17 5	17 5	6.0	†10 0
Lake Charles*	16 5	16 5	6 0	†12.0
Shreveport	16.5	16 5	5.0	†12.0
Knoxville, Tenn.	21.0	21 0	7.0	13.5
Memphis	17 5	17 5	7 0	11 0
Chattanooga	20.5	20 5	7 0	11.0
Nashville	20 0	20 0	7.0	12.5
Bristol	20.0	20 0	7.0	14.0
Lt. Rock, Ark.	17.5	17.5	6.0	11.0

*Includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

†Kerosene prices in Louisiana include 1 cent tax except New Orleans where tax is 2 cents.

Two-cent discount off gasoline and kerosene tank wagon price to dealer and commercial accounts.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Omaha	14.9	15.9	4.0	9.25
McCook	17.0	17.0	4.0	7.5
Norfolk	16.75	17.75	4.0	9.75
N. Platte	17.75	18.75	4.0	10.50
Scottsbluff	17.0	17.0	4.0	9.0

Note—Dealers' discount allowed as follows: Red Crown Ethyl, 3 cents off station price; Red Crown, 2½ cents off normal service station price; Nebraska Blue (third grade), 1 cent off normal service station price.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	10.7	6.23
V.M.P. naphtha	12.7	7.73
Cleaners' naphtha	15.2	9.23
Stanisol	15.2	9.23

Tank wagon prices f.o.b. Chicago January 6, 1932. Each of above prices subject to discount of 1 cent per gallon for 150-gallon lots if covered by contracts.

STANOLIND FURNACE OIL IN CHICAGO

Effective July 1, prices f.o.b. Chicago, tank wagon prices: 1 to 99 gallons, 8 cents; 100 gallons or more, 6 cents.

Stanolex Fuel

Effective May 9, f.o.b. Chicago, tank wagon prices: 1 to 199 gallons, 7 cents; 200 gallons or more, 5 cents. Sinclair met this by bringing down the price of its No. 3.

Fuel Oils

Chicago tank wagon prices (in lots of 400 gallons and over): 38-40 straw distillate, 6 cents; 32-36 gas oil (light zero), 5.5 cents; 32-36 gas oil (industrial), 5.25 cents; 28-30 zero fuel oil, 5 cents; 24-26 fuel oil, 4.25 cents; 18-22 fuel oil, 3.75 cents.

TANK WAGON CHANGES

Standard Oil Co. of New Jersey effective February 17 made a general reduction of one-half cent in gasoline service station prices throughout the territory with exception of Richmond, Va., and Charlotte, N. C., where prices were advanced one-half cent. The company on same date advanced discount off tank wagon price of gasoline to dealers one-half cent per gallon as follows: 2½ cents per gallon off tank wagon price of gasoline except Washington, D. C., and States of Maryland and New Jersey where discount is 3½ cents. Effective February 8

(Continued on Page 95)

CRUDE OIL PRICES

(Continued from Page 85)

WEST TEXAS

Iatan and Westbrook	Same as North Texas
Crane, Upton, Crockett, Howard, Glasscock, Ector, Winkler and Pecos Counties*	$ .50
Lea County, N. Mex.‡	.50
Toborg, Pecos County, Aug. 25, 1931†	.25

*The Texas Company, November 2, 1931; Magnolia Petroleum Co., Humble Oil & Refining Co., Gulf Pipe Line Co., same day. †Shell Petroleum Corp. ‡Humble Oil & Refining Co., The Texas Company, November 2, 1931.

GULF COAST

Grade A and Grade B classifications discontinued by leading buyers	See gravity table
Jennings, La. (Nov. 2, 1931)*	$ .45
Lockport, La. (Aug. 27, 1931)†	See Gulf Coast gravity table
Refugio, light	See gravity table
Refugio, heavy (Nov. 2, 1931)‡	.75
Markham (Nov. 2, 1931)§	.67
High Island (Nov. 2, 1931)¶	.65

*Gulf Refining Co. †Vacuum Oil Co. ‡Humble Oil & Refining Co. §The Texas Company. ¶Gulf Pipe Line Co.

NORTH LOUISIANA AND ARKANSAS

Smackover, Ark. (all grades) (Nov. 4, 1931)	$ .55
Urbana, Ark.	See note below
Bellevue, La. (June 3, 1931)	.25
Urania, La. (Nov. 2, 1931)	.50
Calion, Ark. (Aug. 22, 1931)	.52
East El Dorado, Ark. (Nov. 4, 1931)	.55
Stephens, Ark., below 29° (Aug. 24, 1931)	.41
Stephens, Ark., 29° and above (Aug. 24, 1931)	.44
Other fields	See gravity table

Note—Smackover, all grades, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co., Bellevue posted by Magnolia Petroleum Co.; Urania by H. L. Hunt, Inc., and Louisiana Oil Refining Co.; Calion by Gulf Refining Co.; East El Dorado by Gulf Refining Co. and Magnolia Petroleum Co.; Stephens, Ark., by Louisiana Oil Refining Co. and Atlantic Oil Producing Co.

SOUTH CENTRAL AND SOUTHWEST TEXAS

Darst Creek (Nov. 2, 1931)‡	$ .40
Luling (Nov. 2, 1931)†	.49
Mirando (Nov. 2, 1931)†	.75
Pettus (Nov. 2, 1931)*	.85
Salt Flat (Nov. 2, 1931)*	.60
Thrall§	
Lytton Springs (Lockhart)	See gravity table
Dobrowolski‖	Same as Mid-Continent gravity scale up to and including 38-38.9°.
Somerset¶	Same as Mid-Continent gravity scale up to and including 38-38.9°.

‡The Texas Company. *Humble Oil & Refining. †Magnolia Petroleum Co. §Thrall prices same as North Central Texas less 19½ cents per cwt. freight. ¶Grayburg Oil & Refining Co., Pioneer Oil & Refining Co. and Texas Petroleum Products. ‖Pioneer Oil & Refining Co.

MIDDLE WESTERN STATES

Ohio Oil Co.

(Effective November 3, 1931)

Lima	$1.00
Wooster	1.15
Illinois	.95
Indiana	.60
Princeton	.95
Plymouth	Shut in
Western Kentucky	.90
Midland, Mich. (Oct. 9, 1931)*	.55
Dundee, Mich.†	Same as Stanolind Crude Oil Purchasing Co.'s Mid-Continent gravity scale
Upper and Lower Traverse Sands, Mich.†	Same as Mid-Continent gravity scale
Somerset, Ky. (Nov. 4, 1931)	.80
Hart County, Ky. (Jan. 18, 1932)§	.60

*Posted by Pure Oil Co. †Posted by Standard of Indiana for boat shipment. §Posted by Stoll Refining Co. Somerset, Ky., crude purchased by Ashland Refining Co., Ashland, Ky., and delivered through own pipe line.

MEXICO

Panuco*	$ .45

*F.o.b. ship, based on January transactions and exclusive of production and export taxes and bar dues.

CANADA

Ontario (Nov. 3, 1931):	
Petrolia*	$1.90
Oil Springs*	1.97
Alberta (Aug. 24, 1931):	
Turner Valley†:	
Crude oil 45-45.9	2.03
Crude oil 50 and above	2.65
Crude naphtha	3.13
Discolored naphtha	2.33

*Imperial Oil, Ltd. †Imperial Oil, Ltd., and Regal Oil & Refining Co.

Of Interest to Sales Departments

Gasoline and Other Petroleum Products Carry Big Tax Load

NEW YORK, Feb. 22.—Gasoline and other petroleum products are called upon to bear an increasing proportion of tariff and tax burdens, according to recent reports from many consuming countries. A summary of these changes, of interest to American exporters of refined petroleum products, follows:

Nyasland, Africa. — Import duties on gasoline increased from 2d. to 4d. per imperial gallon.

Argentina. — The Division of Foreign Tariffs, Department of Commerce, Washington, D. C., has received detailed data on the tax changes on gasoline in Argentina, which are available to interested American firms.

Ceylon.—The duty on gasoline imports has been raised from 50 cents to 65 cents per imperial gallon.

Cuba.—The taxes created by the public works law of January 15, 1925, under which were imposed consumption taxes of 10 cents per gallon on gasoline, have been extended to terminate on July 15, 1950.

Finland. — Gasoline tariff maintained at the 1931 level of 1.50 Finnish marks per kilo; benzol tariff increased from 0.10 to 0.40 Finnish marks per kilo. In lieu of higher import duties, a sales tax has been established on both fuels.

Cuba. — Contrary to earlier reports, shippers to Cuba will continue to pay the consular fee for the certification of consular invoices on shipments to Cuba at the visaing consulate. This regulation, carrying a 5 per cent certification fee, remains in force until June 30, 1933.

Gasoline or substitutes are now required to pay an additional consumption tax of 2 cents per gallon in Cuba, making a total consumption tax of 12 cents per gallon. This tax is in addition to the import duty of $1.12 per 100 gross kilograms, plus the general surtax of 3 per cent of duty, plus the emergency surcharge of one-one hundredtth of 1 per cent of the combined import duty and internal taxes.

El Salvador.—An executive decree, effective in April, imposes a sales tax of 30 cents (United States currency) on each 100 kilograms of imported gasoline as a subsidy for the University of El Salvador.

Finland. — Effective for the full year 1932 a sales tax of 0.75 Finnish marks per kilo has been imposed on all gasoline and benzol imported into that country and upon all stocks already on hand. It was stated that this tax was imposed because importers had accumulated large stocks of motor fuels prior to November 14, 1931, anticipating the increase in import duties effective on that date.

LOS ANGELES EXPORTS OF CASE OIL DECLINE

LOS ANGELES, Calif., Feb. 22.—There has been a steady decline in case oil exports from Los Angeles harbor to the Orient and Antipodes during the past several months. Exports have declined from an average of approximately 500,000 cases per month to about 125,000 cases. This decline is due partly to unsettled conditions in China and to the fact that crude oil and gasoline are being exported to the Orient in bulk.

Four new refineries and five new case oil packing plants have been established in China and Japan within the past several months. The latest refinery to begin operations in Japan was one constructed by the Associated Oil Co. and the Mitsubishi interests at Yokohama. A prohibitive tariff on case oil imports into Australia has necessitated a shift to bulk gasoline shipments to the Antipodes but exports of cased kerosene throughout the Oriet, on the other hand, are beginning to increase again after a decided slump, owing to the decline of competition from Soviet Russia.

Indicative of the strengthening kerosene market is the recent shipment of 68,000 cases from Los Angeles to Java and a second consignment of 25,000 cases which left Los Angeles early in February for Straits Settlements ports.

SALE OF THIRD-GRADE GASOLINE ON PACIFIC COAST IS EXTENDED

By L. P. Stockman

LOS ANGELES, Calif., Feb. 23.—Developments during the last few days indicate that major companies ultimately will extend their sales of third-grade gasoline to include practically all points on the Pacific Coast. Installation of third pumps already has been started in the San Francisco Bay region and tentative plans call for the introduction of third-grade gasoline in the Seattle, Wash., and Portland, Ore., districts within the next few days.

When major companies introduced the third-grade gasoline late in January it was the intention to limit its sale to southern California, but subsequent intensification of sales in other districts made it necessary to remove the original area instructions in order to meet additional competitive conditions. Installation of new pumps for the sale of third-grade gasoline at all points on the Pacific Coast is believed to preface a radical change in existing marketing practice.

The erection of numerous superservice stations by major companies on the Pacific Coast is taken to indicate that many of them expect to market petroleum products through their own retail outlets exclusively. This would eliminate costly duplication of facilities and tend to stabilize prices as independent resellers no longer would be able to disturb the entire price structure by price cutting. Many independently owned stations would be eliminated by the adoption of this policy.

The third-grade gasoline of major companies has a low octane rating and is further characterized by a relatively high initial.

It may be necessary for major companies later to increase the octane rating of the third-grade gasoline and blend in a little casinghead to give quicker starting. They cannot raise the specifications of the third grade much, however, without reducing the sales of the first grade. Even under present conditions some motorists have adopted the policy of using the third-grade gasoline and sweetening this with Ethyl Gasoline or other high octane-rated gasoline.

Independent refiners, following the lead of major companies, have started marketing gasolines with varying specifications and at various prices. The Southern California Petroleum Dealers Association has been conducting a survey to determine the feasibility of marketing several grades of gasoline refined by independent refiners according to specifications of the association. Some members of the association have been marketing three grades of gasoline during the last few weeks and the outcome of this test may determine the future policy of the association.

The three grades involved in this marketing test are "Republic" gasoline, which has been retailing at 14 cents per gallon, "Ace," retailing slightly lower, and a no-brand gasoline which is marketed at competitive prices. Dealers handling these three grades are protected on a tank wagon price which is guaranteed not to exceed the general prevailing tank wagon quotation. Sales of the "Republic" gasoline have been moderate.

When major companies introduced the third-grade gasoline, premium gasolines were removed from some pumps and these installations temporarily used for the distribution of the third grade. In most cases new pumps have been installed for the sale of premium gasoline with the result that practically all stations of major companies in southern California now have pumps for the three different grades of motor fuel.

DERBY GETS CONTRACTS FROM WAR DEPARTMENT

NEW YORK, Feb. 22. — The Derby Oil Co. of Wichita, Kans., has received War Department contracts for tank car deliveries of gasoline calling for 30,000 gallons for Erie at 7.055 cents per gallon, 10,000 gallons for Fairfield at 7.055 cents, 30,000 gallons for Harrison at 6.465 cents, 40,000 gallons for Fort Hayes at 7.185 cents, 20,000 gallons for Savannah at 6.005 cents, 70,000 gallons for Chicago at 6.005 cents, 108,000 gallons for Chanute Field at 6.005 cents, 20,000 gallons for Camp Custer at 7.125 cents, 20,000 gallons for Jefferson Barracks at 5.605 cents, 20,000 gallons for Camp McCoy at 6.395 cents, 10,000 gallons for Scott Field at 6.005 cents, 30,000 gallons for Fort Sheridan at 6.235 cents, 35,000 gallons for Rock Island at 5.965 cents, 65,000 gallons for Fort Leavonworth at 5.305 cents, 10,000 gallons for Fort Crook at 5.805 cents, 10,000 gallons for Fort Des Moines at 5.805 cents, 40,000 gallons for Fort Riley at 4.915 cents, 10,000 gallons for Fort Robinson at 8.775 cents, 20,000 gallons for Omaha at 5.805 cents and 30,000 gallons for Jeffersonville at 6.465 cents.

OIL A MEDICINE

NEW YORK, Feb. 22.—Imports of Russian mineral oil intended for human consumption has been ruled dutiable as a medicine, notwithstanding the fact that it is therapeutically inert, according to a ruling by the Commissioner of Customs.

Russian mineral oil has hitherto been admitted duty free as a petroleum distillate on the ground that it has no therapeutic qualities and is merely a lubricant.

The current ruling of the Customs Commissioner, however, classifies mineral oil as a medicinal preparation under Paragraph 5 of the Tariff Act of 1930, which carries an import duty of 25 per cent.

CANADIAN GASOLINE PROBE

CHATHAM, Ontario, Feb. 22.—The federal government in Ottawa has announced that an investigation of Canadian gasoline prices will be conducted at this session by the parliamentary committee on banking and commerce. The investigation was requested by parliamentary representatives of the western provinces. Three leading Canadian refining companies, Imperial Oil, Ltd., British-American Oil Co. and McColl-Frontenac Oil Co., offered full co-operation in ascertaining the facts.

New Organization Is Formed by Five Old Concerns in Indiana

INDIANAPOLIS, Ind., Feb. 22.—The Supreme Oil & Refining Co., White Star Oil Co., White Star Eastern Oil Co., White Star Motor Oil Co. and White Star Southern Oil Corp., all Indiana companies in operation since 1920, have joined in the formation of a new company, the White Star Oil Corp., which is affiliated with the Lubrite Refining Corp. of St. Louis, Mo., a subsidiary of the Vacuum Oil Co., Inc. The management, policies and personnel of the first named companies will continue in the new White Star Oil Corp., supplemented by the distribution of Mobilgas and Mobiloil, products of the Vacuum Oil Co.

The officers of the new corporation are as follows: H. H. Johnson, president; Henry Stelck, vice president; P. J. Buttles, secretary; and C. E. Werner, treasurer.

The directors follow: Henry Stelck, H. H. Johnson, I. W. Lemaux, F. E. Matson and H. E. Strickler, all of Indianapolis; R. M. Chan and L. B. Davis, of New York; and H. T. Ashton and W. H. Ware, of St. Louis.

The territory heretofore covered by the Supreme Oil & Refining Co. consists of Marion County, Hancock County, Hamilton County, Boone County and Tipton County; the White Star Motor Oil Co., Cass County, White County, Pulaski County, Fulton County, Miami County, Howard County and Carroll County; the White Star Eastern Oil Co., Henry County, Fayette County, Union County, Decatur County, Franklin County and Rush County; the White Star Southern Oil Corp., Jefferson County, Ripley County and Jennings County; and the White Star Oil Co., Shelby County, Bartholomew County, Johnson County, Morgan County, Brown County and Jackson County.

CANDIDATES FOR OFFICE ANNOUNCED BY OIL CLUB

NEW YORK, Feb. 22.—The Oil Trades Association of New York will hold its annual meeting and election March 8, following the annual dinner to be served in the roof garden of the Waldorf-Astoria Hotel. Important changes in the association's by-laws will also be voted on.

The nominees for office during the coming club year are as follows: For president, Clifford T. Weihman, Smith-Weihman Co.; vice president, William S. Williams, Asiatic Petroleum Corp.; secretary, Joseph C. Smith, Smith-Weihman Co.; treasurer, Phillip C. Meon, Borne-Scrymser Co.; chairman of entertainment committee, Albert J. Squier, Warren Lubricant Co.; directors, George Suraud, Chelsea Oil & Supply Co.; Edwin Stern, Louis Stern Sons, Inc.; W. H. Correa, Standard Oil Co. of New York; J. W. Saybolt, Standard Oil Co. of New Jersey; H. Mart Smith, W. R. Grace & Co.; John W. Baker, Philippine Refining Co. of New York; E. C. Biglow, Sun Oil Co., and D. T. Bloodgood, United Africa Co.

ANOTHER FIRESTONE BUILDING

Harvey S. Firestone has announced his second new building project for Chicago within a year—a Firestone one-stop service store to be built at West Madison Street and Kostner Avenue, involving an investment in land, building and equipment of approximately $150,000. According to the announcement, the building permit has been issued, ground will probably be broken within a month, and the building completed by June.

Influences of Foreign Demand on U. S.

Situation Analyzed in Light of Available Data in Relation to Bearing on Well Being of Domestic Refineries

By E. B. Swanson
Chief Economist, Petroleum Economics Division, U. S. Bureau of Mines*

Frequent reference has been made to the increased domestic gasoline demand recorded for 1931. This increase was in the neighborhood of 7,000,000 bbls. Although smaller relatively than that to which the oil industry had become accustomed by virtue of the experience of preceding years, the increase was of substantial amount, particularly at a time when any increase at all could be regarded with eminent satisfaction. Less has been said, however, of the 18,000,000-bbl. decline in gasoline shipments to territories and foreign countries. When the loss of business outside the United States is combined with the domestic increase, there results a net loss of some 11,000,000 bbls. in total gasoline demand. The gain of 2 per cent in domestic sales gives way to a loss of 2.5 per cent in total domestic and foreign sales.

The United States actually has been losing ground in the international gasoline market since 1924, when shipments from this country equaled 72 per cent of the gasoline shipments from the leading gasoline-producing countries of the world. A loss in relative standing was recorded with each succeeding year. As long, however, as gasoline shipments showed an actual increase, the loss in relative standing was of little concern. Foreign producing centers annually supplied an increasing share of the foreign gasoline markets, but, until the past year, the demand abroad continued to increase at a pace which could accommodate all of the increased output of foreign plants and yet require increasing quantities from the United States. It was not until 1931 that the various factors were combined so as to produce an actual and substantial decrease in the foreign demand for United States gasoline. Consumption in foreign countries generally declined, while the output of foreign refineries and the foreign manufacture of substitute fuels continued to increase. From our own viewpoint, this meant a loss of some 18,000,000 bbls. of gasoline business in foreign countries, one-half of it probably due to the lowering in foreign demand and the other half to the increased output of foreign refineries and the increased utilization of substitute fuels.

Adjustment to Demand Difficult

The oil industry of this country found a difficult task in adjusting its operations to meet this changing condition of demand. Stocks began to accumulate and the gasoline which normally would have gone into foreign trade was forced back upon the domestic market. This contributed to a general increase in gasoline stocks, as domestic distribution channels were rearranged. For more than a year, the industry has been handicapped by the decline in foreign demand. The decline itself was not unexpected, but its severity exceeded the anticipations of those who have been engaged in the economic studies associated with the oil industry.

Committees of the American Petroleum Institute and the Federal Oil Conservation Board, in their separate reports covering the period from October 1, 1930, to April 1, 1931, continued the formal forecasting of demand for the major petroleum products which had been inaugurated six months previously. Both committees anticipated for that period a total gasoline demand of 208,000,000 bbls. consisting of 175,400,000 bbls. to supply domestic demand and 32,600,000 bbls. of exports. The Institute committee favored a total of 40,000,000 bbls. in gasoline stocks as the industry's objective at the close of the period. To accomplish this, under the demand conditions anticipated, refinery gasoline production of 200,600,000 bbls. was calculated. These were the expectations.

When the period closed, refinery gasoline stocks amounted to nearly 48,000,000 bbls. The objective had been missed by nearly 8,000,000 bbls. The refiners produced about 1,000,000 bbls. more than the program outlined, but this was offset by a larger decline in gasoline imports. Production, consequently, was in accord with the demand which had been anticipated. When actual demand failed to meet the expected totals and production was not reduced accordingly, the stock increase resulted. Had gasoline demand reached the anticipated levels, and had there been no other disturbing factors, the stock objective would have been nearly attained.

The amount by which actual demand failed to meet the expected was very nearly equal to the amount by which gasoline stocks exceeded the objective established, or about 8,000,000 bbls. Domestic demand failed to meet the expected by about 1,000,000 bbls. and foreign demand failed by about 7,000,000 bbls. Consequently, 7,000,000 bbls. of the 8,000,000 bbls. by which stocks exceeded the objective may be compared with the 7,000,000 bbls. by which foreign gasoline demand failed to meet anticipated levels.

Foreign Sources

With this experience in mind, the Federal committee considering the next six months, April to September, 1931, allowed for a decline of 15.4 per cent in gasoline shipments of foreign countries, or in quantity, a drop of about 5,300,000 bbls. Again domestic demand was in strict accord with the estimates, but foreign demand fell off nearly twice as much as expected. The actual decline amounted to 10,000,000 bbls., or 29 per cent. Looking back over the record, it is evident now that the committee made proper allowance for the decline in foreign consumption but did not allow for the displacement of United States shipments by gasoline from foreign sources of supply. Stocks of gasoline at refineries were again in excess of the objective and again it appeared that the quantity of excess storage was closely in accord with the unexpected decline in foreign shipments.

A fiscal year of formal forecasting in the oil industry was completed on September 30, 1931. In the report covering the first half of the year, no decline was anticipated in gasoline exports. The influence of the 7,000,000-bbl. decline has been outlined. In the report for the second half of the year, a substantial decline was anticipated, yet the actual decrease outdistanced that anticipated. Nevertheless, during the second half the oil industry did adjust operations to meet all of the expected and part of the unexpected decline.

The two committees also have prepared reports covering the nine months, beginning with October, 1931, and closing with June, 1932. In both reports, a sharp reduction from the totals of the preceding period was forecast for gasoline exports. The Federal report estimated exports of 7,260,000 bbls. during the first two months; actual shipments totaled 7,204,000 bbls. The Institute committee was equally close. It appears, then, that the two planning committees for the present period have discounted adequately the several factors tending to reduce exports. There is no definite indication, however, that the industry itself has realized the full significance of the decline and its tendency to influence domestic conditions in all refining areas.

Many influences are at work abroad which tend towards a complete readjustment of the world gasoline situation. Primarily, there has been an increasing crude oil production abroad which, coupled with the expansion of refining facilities, permits the greater distribution and use of foreign oils refined in foreign countries. Increased production of benzol and hydrogenation of crude oil tend to restrict the market for refinery gasoline in certain areas. The compulsory mixture of alcohol has a similar influence.

A return to bartering procedure is shown in the reported efforts to exchange gasoline for goods. Complete restriction by foreign countries against imports of refined products is another indicator of the trend. Increased tariffs and taxes which tend on the one hand to favor the development of local refining and on the other hand to limit consumption are matters both of discussion and fact. There are state monopolies, actual and potential, which tend to limit free marketing. The organization of joint marketing companies has resulted in a definite rearrangement of the trade links connecting markets with the several possible sources of supply and undoubtedly has strengthened the competitive influence of the merging groups by enabling each market to be served from the nearest producing area.

It is only natural that these changes should be evident first in the principal foreign gasoline markets and the areas adjacent to the principal foreign sources of supply. The European and Latin American markets, as a result, show more evidence of such readjustments than do the Near and Far Eastern markets. With continued development of foreign production and refining, the eastern markets inevitably will exhibit the same tendencies.

European Gasoline Situation

The principal European markets for gasoline are the United Kingdom, France and Germany. The principal foreign sources of gasoline supply are the U.S.S.R., the Dutch West Indies, Rumania and Persia. The most recent available data on receipts and shipments of gasoline in these countries are summarized herewith:

United Kingdom.—With refineries operating at approximately 30 per cent of capacity, about one-fifth of the gasoline needs are supplied from local production and the remainder from imports. During the first 44 weeks of 1931, gasoline imports were approximately 2,000,000 bbls. less than in the same period of 1930, but receipts from the United States were 4,000,000 bbls. less. The United States supplied 56 per cent of the gasoline imports during the 1930 period and 44 per cent during the 1931 period. Notable increases were recorded in receipts from Rumania and the Dutch West Indies, while smaller increases were reported in receipts from the U.S.S.R., the Netherlands East Indies and Trinidad. Receipts from Persia dropped in substantial amount.

France. — Second in standing among European gasoline-importing countries, France is the only major country to report a significant increase in gasoline receipts. During the first 11 months of 1931, France imported 17,110,000 bbls. of gasoline, an increase of 14 per cent over the corresponding 1930 receipts of 14,983,000 bbls. Despite the increase in total gasoline imports, receipts from the United States declined 1,445,000 bbls., or 17 per cent, from the 1930 total of 8,388,000 bbls. The United States supplied 56 per cent of French gasoline imports during the 1930 period and 41 per cent during the 1931 period. Increases in excess of 1,000,000 bbls. were recorded in receipts from Rumania, the U.S.S.R. and Persia. A substantial decrease was recorded in receipts from the Dutch West Indies and Venezuela.

Germany. — Ranking next to France among European gasoline markets, Germany recorded a decrease of 15 per cent in gasoline receipts during the first 10 months of 1931, in comparison with the same 1930 period. Quantitatively, the decrease amounted to 1,747,000 bbls., of which the decrease in receipts from the United States accounted for 1,404,000 bbls. The United States' share in the German gasoline market dropped from 49 per cent in the 1930 period to 43 per cent in the 1931 period. Receipts from the U.S.S.R. increased 538,000 bbls., raising the Russian share from 12 per cent in 1930 to nearly 20 per cent in 1931. The decline in German gasoline imports is not an indication of a similar decrease in consumption, as local production of benzol and other motor fuels is reported to have increased.

Summarizing the situation, as outlined, in the three principal European markets for the periods covered, total gasoline receipts dropped from 51,680,000 bbls. in the 1930 period to 50,068,000 bbls. in the 1931 period, a decrease of 1,612,000 bbls., or 3 per cent. Receipts from the United States dropped from 28,188,000 bbls. in 1930 to 21,312,000 bbls. in 1931, a decrease of 6,876,000 bbls., or approximately 5,000,000 bbls. more than the total decrease in receipts. This would indicate that gasoline from foreign sources of supply last year displaced in the three principal European markets more than 5,000,000 bbls. of gasoline from the United States.

Turning from the European markets to South America, it is noted that Argentine gasoline imports during the first six months of 1931 totaled 1,037,000 bbls., a number only slightly lower than the 1,103,000 bbls. imported during the 1930 semester. Receipts from the United States, however, declined 687,000 bbls. An increase of 371,000 bbls. in receipts from the Dutch West Indies and 247,000 bbls. in receipts from Mexico nearly compensated for the decline in receipts from the United States.

This brief review of changes in certain of the principal foreign markets leads to the review of data available from foreign centers of production.

Foreign Production

The Dutch West Indies, quantitatively the most important producing center outside of the United States, shipped virtually the same amount of gasoline during the first 11 months of 1931 as was shipped during the corresponding 1930 period, nearly 16,000,000 bbls. in each instance. The significant difference in the two periods is the decrease of nearly 2,600,000 bbls. in shipments to the United States and an increase of nearly the same amount in shipments to Europe, Latin America and other regions. The gasoline which was not shipped to the United States moved to other markets and there displaced gasoline which otherwise probably would have been shipped from this country.

Shipments of gasoline from the U.S.S.R. increased from 10,317,300 bbls. during the first 10 months of 1930 to 12,475,700 bbls. during the comparable 1931 period, a gain of 2,158,400 bbls., or 21 per cent. About two-thirds of the Russian gasoline exports are sent to the three principal European markets — the United Kingdom, France and Germany— and the 1931 increase in Russian shipments is almost entirely accounted for in the increases shown in the gasoline receipts of these three countries.

Although Rumanian gasoline is shipped to nearly all European countries, increased shipments have been destined

*Before A.I.M.E., New York, February, 1932. Printed by permission of the Director, U. S. Bureau of Mines.

principally for the United Kingdom and France. Figures for all Rumanian shipping centers show an increase of 50 per cent during the first six months of 1931, in comparison with the 1930 semester, gasoline shipments in 1931 amounting to 6,964,000 bbls., as compared with 1930 shipments of 4,627,000 bbls. Figures covering 10 months for Constantza, the principal shipping port, show an increase of 89 per cent, 9,220,000 bbls. of gasoline having been shipped in the 1931 period, as compared with 4,883,000 bbls. during the 1930 period.

Rumanian producers appear to have consolidated their 1931 gains in the French market, as French importers are reported to have agreed to purchase a minimum of 3,000,000 bbls. of oil products annually from Rumanian producers. The past year, according to available records, is the first in which Rumanian producers have delivered as much as 3,000,000 bbls. of gasoline and fuel oil to French marketers. The agreement, it is indicated, contemplates the progressive substitution of crude oil as French refineries develop, and is reported to cover a three-year period.

Current data are not available on gasoline exports from Persia, but the recorded receipts in the European markets indicate that the increase, if any, would be of minor importance. The significant change appears to be one of destination rather than of quantity. The decrease in receipts of Persian gasoline in the United Kingdom, coupled with a corresponding increase in receipts from the Dutch West Indies, and an increase in Persian gasoline receipts in France, coupled with a decrease in receipts from the Dutch West Indies, would indicate a rearrangement of trade channels whereby the respective markets could be served from the closer source of supply.

Fuel Oil

An endeavor has been made in the foregoing analysis to present a brief but concise portrayal of some of the changes in the world gasoline markets and their influence on the domestic oil industry. What has been said of gasoline may be repeated in part for fuel oil. It is again an account of increasing foreign production and its displacement of fuel oil previously shipped from the United States. The scene of principal influence shifts, however, from the European markets to those of Latin America. In point of time, the transitions in fuel oil influenced shipments from this country at an earlier date than did the changes in the gasoline markets. While gasoline exports did not show an actual decline until 1931, fuel oil shipments have been lower each year since 1927, being in 1930 about 11,000,000 bbls. and in 1931 about 17,000,000 bbls. less than the 1927 peak.

Shipments of gas and fuel oil from the United States to the principal Latin American countries were nearly 12,000,000 bbls. less in 1930 than in 1927. Shipments of gas oil and fuel oil from the Dutch West Indies to these Latin American countries increased nearly 12,000,000 bbls. during the same period. The transition was evident, particularly with regard to Argentina. Shipments from the Dutch West Indies to Argentina were 4,080,000 bbls. larger during 1930 than in 1927; shipments from the United States were 4,018,000 bbls. less. For the neighboring country of Uruguay, no fuel oil shipments were recorded from the Dutch West Indies in 1927; during 1930 a total of 2,087,000 bbls. was shipped. Shipments from the United States declined 1,439,000 bbls. during the period to virtually nothing in 1930.

Turning again to European markets, recent German import statistics do not record any noticeable changes. Imports of gas and fuel oil in France have increased from 2,350,000 bbls. in 1925, the United States supplying 983,000 bbls., to nearly 5,300,000 bbls. during the first 11 months of 1931, the United States supplying about 268,000 bbls. While total receipts more than doubled, receipts from the United States were only a third of the previous total. Shipments from the Caribbean area, Rumania, Russia and Persia, accounted for virtually all of the gain.

The loss of a substantial amount of fuel oil sales in foreign countries, while not directly responsible, has an indirect influence on the status of domestic fuel oil stocks. The retention of any major share would have been helpful.

Looking for a moment at lubricating oils—exports from the United States during the past year were about 20 per cent less than in 1930, but such a decrease might be said to be nearly in accord with the probable decline in demand. Nevertheless, there is some evidence of increasing foreign manufacture. In Great Britain, for example, lubricating oil production has advanced steadily during the past several years, increasing from 180,000 bbls. in 1925 to 694,000 bbls. in 1930. Colombia, with its one refinery, began the manufacture of lubricating oils during 1930, turning out 17,024 bbls. during the latter portion of the year and 20,051 bbls. during the first half of 1931.

Ratio of Exports

The essential fact is that foreign production of gasoline has been increasing, more rapidly than foreign demand, and consequently a larger share of the foreign business is being supplied from foreign sources. As a result of this tendency, the ratio of gasoline shipments from the United States to the total shipments of the 10 leading gasoline-producing countries dropped from 49 per cent in 1930 to about 40 per cent in 1931.

It is to be expected that consumer demand in foreign countries will recover to former levels and increases above such levels are an ultimate anticipation. The probability of further refining construction in foreign countries and of a higher rate of operation of the equipment now running considerably below capacity indicates that the tendency towards increased foreign production is a stronger present factor than any immediate expectancy of increased demand. Until such time, consequently, as foreign demand increases at a higher rate than foreign production, it is not to be expected that gasoline shipments from the United States will approach their former levels. The conditions applying to foreign gasoline are paralleled with respect to fuel oil, although differing somewhat geographically and in point of time. There is evidence, too, that increased foreign production of lubricating oils may be expected.

It is not the purpose of this paper to comment on probable causes, to propose any action or even to assume that remedial measures are possible. The purpose is merely to analyze the situation in the light of available data and to suggest the importance of adequate knowledge of trends in foreign markets, as these trends undoubtedly have a definite bearing on the economic well-being of domestic refineries, not only those located at shipping points but also those far removed from tidewater.

DICKEY HEADS TOPICAL COMMITTEE ON RESEARCH

Donald E. Dickey, of the Broderick & Bascom Rope Co., Los Angeles, has been named national chairman of the topical committee on development and production research (of the American Petroleum Institute's central committee on drilling and production practice) which has been appointed for 1932. Other members of the committee, appointed by Charles F. Roeser, chairman of the division of production, are:

California district—G. V. D. Marx, Standard Oil Co., chairman; C. J. Coberly; F. E. Davie, Shell Oil Co.; John F. Dodge, University of Southern California; Stanley C. Herold, Union Oil Co.; William N. Lacey, California Institute of Technology; F. G. Tickell, Stanford University, and Lester C. Uren, University of California.

Eastern district—K. B. Nowels, Forest Oil Corp., chairman; Charles R. Fettke, Carnegie Institute of Technology; Paul V. Foote, Gulf Oil Co., N. C. Fowler, U. S. Bureau of Mines; Joseph A. Holmes, Jr., Pan American Petroleum & Transport Co.; H. J. Lowe, Pure Oil Co., and H. B. Soyster, U. S. Geological Survey.

Mid-Continent district—C. V. Millikan, Amerada Petroleum Corp., chairman; L. G. E. Bignell, The Oil and Gas Journal; Joseph Chalmers, U. S. Bureau of Mines; K. A. Covell, Indian Territory Illuminating Oil Co.; A. F. Melcher and H. H. Power, Gypsy Oil Co.

Rocky Mountain district—F. E. E. Germann, University of Colorado, chairman; B. B. Boatright, Colorado School of Mines, and J. J. Zorichak, Midwest Refining Co.

Southwestern district—H. D. Wilde, Jr., Humble Oil & Refining Co., chairman; M. G. Cheney, Anzac Oil Co.; R. H. Fash, Fort Worth Laboratories, and Stanley Gill.

SOUTHWEST DISTRICT PRODUCTION MEETING

Drilling and producing problems in East Texas will be the subject for principal discussion at the spring meeting of the southwestern district of the American Petroleum Institute, Division of Production, it has been announced by E. Stanley Durward, district chairman. The sessions will be held at Tyler on April 14 and 15. Chairman Durward heads the committee that has been authorized to prepare the program for the spring meeting, and other members are: W. W. Scott, Humble Oil & Refining Co., Houston; H. M. Staggs, Atlantic Oil Producing Co.; M. Albertson, Shell Petroleum Corp.; Blaine Johnston, Simms Oil Co.; John A. Ritter, Sun Oil Co., all of Dallas, and R. B. Kelly, Pure Oil Co., Fort Worth.

The annual election of district officers will be held and a nominating committee has been appointed with Walter H. Meier of the Atlantic Oil Producing Co., Dallas, as chairman, and C. W. Alcorn of Shell Petroleum Corp., Dallas, and Sam Gladney, Sun Oil Co., Dallas, as associates.

MEXICAN PRESIDENT SUSPENDS PERMITS

President Pascual Ortiz Rubio of Mexico has announced a presidential decree which suspends until further notice the granting of government permits for the exploitation of petroleum throughout Mexico. The decree was issued "for the public good," the president stated.

It also orders the department of industry to proceed at once to study all existing petroleum permits in order to make recommendations on what fixed basis future permits will be issued.

The decree, regarded as extremely important, has the effect of halting all petroleum exploitation in Mexico which is not now in process or for which permits have not been granted. It does not affect production or exploitation for which permits have already been granted, however.

The decree states that there is a great lack of uniformity in the exploitation of the national petroleum reserves and that this "anarchy" is highly prejudicial to the public interest.

DIRECTORS OF A.P.I. PROTEST FEDERAL TAX

NEW YORK, Feb. 22.—Directors of the American Petroleum Institute, meeting here, emphatically reaffirmed their protest against the proposed federal tax on gasoline sales, and discussed other phases of taxation. The institute announced that, in line with suggestions made by The Oil and Gas Journal and other interests, February 25, the thirteenth anniversary of the first imposition of a gasoline sales tax in the United States (1 cent per gallon in Oregon) would be observed as "national gasoline tax protest day," arrangement being made with petroleum producers, marketers, refiners and all other branches of the industry to deluge their representatives in Washington on that day with telegrams of protest against the proposed federal levy, which, petroleum interests fear, will be but a repetition of the history of gasoline taxation in other states and ultimately will impose an unbearable burden on the industry.

C. B. Ames of The Texas Company, in introducing the resolution suggested a general manufacturers' tax instead of singling out individual industries to carry the increased tax burden. It has been shown, he said, that through state taxation the levy on gasoline now amounts to 100 per cent of the wholesale price of the commodity, and a 1-cent federal tax would increase that rate by 25 per cent. The board also considered a report from representatives of the industry in Pennsylvania, reviewing the manufacturers' sales tax in Canada.

It was reported that the campaign to combat gasoline tax evasion is progressing, and that organized effort is under way in virtually every state. Paul E. Hadlick, secretary of the institute's Division of Marketing, reported state officials generally are taking steps for more complete and efficient enforcement of the gasoline tax laws.

THE OIL MAN'S CALENDAR

March

7-8—Cleveland, Ohio, Committee D-2.

7-11—Cleveland, Ohio, American Society for Testing Materials.

10—Los Angeles, Calif., annual banquet, California Oil and Gas Association.

14-18—New Orleans, La., American Chemical Society.

21-27—Los Angeles, Calif., third annual Oil Equipment and Engineering Exposition.

23-25—Detroit, Mich., Michigan Oil Men's Association, Statler Hotel.

24-26—Oklahoma City, Okla., American Association of Petroleum Geologists.

28-Apr. 1—New Orleans, La., American Chemical Society.

29—Ranger, Tex., Plant Operators meeting, Natural Gasoline Association of America.

April

First week—Excelsior Springs, Mo., Western Petroleum Refiners Association.

2-10—Detroit, Mich., National Aircraft Show.

6-8—Birmingham, Ala., Distribution Committee, Technical Section, American Gas Association.

11-16—Boston, Mass., ninth annual convention, American Oil Burner Association.

21-22—Cleveland, Ohio, semiannual meeting, National Petroleum Association.

22-24—Dallas, Tex., Petroleum Industry Electrical Association, Baker Hotel.

27-29—White Sulphur Springs, W. Va., National Pipe and Supplies Association, Greenbrier Hotel.

27-29—New York, annual meeting, American Welding Society.

May

4-6—Honolulu, Hawaii, National Foreign Trade Council.

9-11—Tulsa, Okla., Natural Gas Department, American Gas Association.

9-13—Atlantic City, N. J., National Fire Protection Association.

17-19—Tulsa, Okla., Natural Gasoline Association of America, Mayo Hotel.

June

1-3—Tulsa, Okla., mid-year meetings, American Petroleum Institute, Mayo Hotel.

6-9—Detroit, Mich., National Association of Purchasing Agents.

20-24—Atlantic City, N. J., American Society for Testing Materials.

September

14-16—Atlantic City, N. J., Annual meeting, National Petroleum Association.

November

15-17—Houston, Tex., Annual meeting, American Petroleum Institute.

DATA ON FLOW OF ROTARY DRILLING MUD

(Continued from Page 16)

both viscosity and "yield point pressure" of the muds.

For 70-pound mud,

$$Q = 1.24D^{2.6}\left(P - \frac{33.3}{D}\right)^{0.54}$$

For 80-pound mud,

$$Q = 1.08D^{2.6}\left(P - \frac{100}{D}\right)^{0.54}$$

For 90-pound mud,

$$Q = 0.97D^{2.6}\left(P - \frac{167}{D}\right)^{0.54}$$

where:

Q = quantity flowing in gallons per minute.

P = pressure loss per 1,000 feet, pounds per square inch.

D = inside diameter of line inches.

These formulas are considerably more accurate than the diagram actually used (Figure 2) but they are not satisfactory for practical work in the field, because they can be used only by "trial and error" to determine the quantity of mud that can be pumped with a given pressure, or the pressure necessary to circulate a given quantity of mud through a given pipe line with various fittings, in series with an annular passage.

In order to simplify the calculation, shearing force and fluid friction are figured separately, and the same viscosity is used for all weights of mud. Since the actual viscosity range is only between 7 and 11 centipoises, this approximation is justifiable for practical work, as the shearing strength of the mud is the property that is chiefly responsible for variation in its behavior.

Flow of Mud in Wells

A series of equivalents has been computed, giving the lengths of drill pipe that will cause the same loss in pressure as various equipment such as tool joints, bits, driving stems, etc., so that the whole system can be expressed as an "equivalent length" of drill pipe—that is, a length of drill pipe that would give the same pressure drop as the actual length plus other equipment. The equivalents that are used most frequently are given in Table 1. Tool joints and driving stems are believed to be present A.P.I. standard.

Equivalents, Shear

For calculations regarding circulation in wells, the shear in tool joints, kellys, hose and bits is not large enough to be considered, and it is only necessary to figure shearing pressure in the drill pipe and the annular return space outside it, the latter being expressed as a length of drill pipe of the same size as in the hole, by multiplying the length of annular space by the factor in Table 1 (inclined figures). For sizes of casing or hole not listed, the factor can be calculated as follows:

Let:

D = outside diameter of annular space, inches,

d = inside diameter of annular space, = outside diameter of drill pipe, inches,

d_1 = inside diameter of drill pipe, inches,

F = "yield point" of mud, pounds per square foot,

P = pressure to cause shear, pounds per square inch.

The shearing resistance per foot length of annular space is:

$$\pi F\frac{(D + d)}{12}L$$

The force causing shear is $\frac{\pi P}{4}(D^2 - d^2)$

(pressure × cross sectional area).

These are equal at yield point

$$\frac{\pi P}{4}(D^2 - d^2) = \pi F\frac{(D + d)}{12}$$

whence

$$P = 0.333F\frac{(D + d)}{D^2 - d^2}$$

which is the pressure drop in pounds per square inch per foot of length to start and maintain shear in annular passages.

The ratio of this shear pressure drop to that inside the drill pipe is:

$$\frac{0.333F\dfrac{D + d}{D^2 - d^2}}{0.333F\dfrac{1}{d_1}} = d_1\frac{D + d}{D^2 - d^2}$$

which is the "factor" by which length of drill pipe having shear resistance equal to 1 foot length of annual space is calculated.

Equivalents, Fluid Friction

For fluid friction the equivalent length of drill pipe for manifold and hose, driving stem, tool joints, bit, and return space outside the drill pipe must be computed. Losses in tool joints, etc., are based on limited test data, which can be improved upon as information accumulates, but are good enough for ordinary oil field estimating. An approximation is necessary in converting orifices such as tool joints to equivalent lengths of pipe, since the pressure loss in square-edged contractions of this type varies about as the square of the quantity flowing, while the loss in a pipe varies as the 1.85 power of the flow. Since it is necessary to convert the whole system into an equivalent length of one size pipe in order to simplify the computations to the point of practical utility, the factors in the table were calculated for average conditions, but may be in error up to 10 per cent for very high or very low rates of flow.

The "equivalent factor" for annular passages is different for fluid friction than for shear. It was calculated by first computing the diameter of a circular pipe having the same resistance to flow as the annular space, by the formula

$$d_m^5 = (D^2 - d^2)^2(D - d)$$

where

d_m = diameter of equivalent circular pipe, inches

d = outside diameter of drill pipe, inches

D = inside diameter of casing, inches.

Having this equivalent diameter, the length of drill pipe corresponding to 1 foot of pipe of diameter d_m was determined by dividing the 4.86 power of the inside diameter of drill pipe by the 4.86 power of d_m.

All the above constants are assembled in Table 1.

The diagram, Figure 2, is used in figuring pressure drops in the final equivalent pipe line, for three different weights of mud. The diagram is a rough means of solving the equations of flow which have been stated previously. Values for muds of densities intermediate to those specified are interpolated for shear on the scales by eye.

Use of Data

The method of using the data for solving mud flow problems is much simpler than suggested by the explanation of the reasoning upon which the method is based. The procedure is as follows:

Given a length of drill pipe and specified fittings, working in a hole of known diameter, and a known pump pressure and weight of mud, to find the rate of circulation of mud, the steps are as follows:

1. Figure the equivalent length of drill pipe for shear. This is the sum of the actual length of drill pipe, plus this length multiplied by the shear equivalent factor found in Table 1, giving equivalents for the annular space between the sizes of pipe and casing specified.

2. From the diagram, Figure 2, for the weight of mud used, find the shear per 1,000 feet of the drill pipe, multiply it by the number of thousands of feet equivalent length in step 1, to get shear pressure loss. (This does not vary with rate of flow).

3. Subtract the shear pressure loss from the actual pump pressure to get the net pressure available for fluid friction.

4. Compute the equivalent length of (a) manifold and hose, (b) kelly stem, (c) drill pipe, (d) tool joints, (e) bit, (f) annular return space, in terms of length of drill pipe, for fluid friction, and add all these equivalent lengths to the drill pipe length.

Divide the net pressure found in operation 3 by the number of thousands of feet of determined equivalent length of drill pipe to get the pressure drop per 1,000 feet for fluid friction.

5. Enter the diagram (Figure 2) with size of drill pipe and pressure drop per 1,000 feet and read flow in gallons per minute.

Flow of mud in line pipe can be figured with the same diagram, always remembering to allow for any difference of elevation between the ends of the line.

Example: Given—5,200 feet of 4½-inch, 16.6-pound drill pipe, 170 tool joints, working through 8⅝-inch casing. On 6-inch by 51-foot kelly, bit has 2 to ¾-inch holes. Pump pressure 850 pounds per square inch. How much 80-pound mud will circulate?

Solution:

	Feet
Equivalent length for shear:	
Drill pipe length	5,200
Equivalent length outside drill pipe 5,200 × 1.31	6,812
Ttl. equivalent length 4½-in. shear	12,012
Equivalent length, fluid friction:	Feet
Drill pipe	5,200
Tool joints, 170 × 76	12,920
3-inch pipe and hose, surface	640
6 in. × 51-ft. Kelly	900
Bit, 2 to ¾-inch holes	1,630
Space outside drill pipe 5,200 × 0.165	860
Ttl. equivalent 4½-in. fluid friction	22,150
Pressure:	Lbs.
Available pressure	850
Shear (Figure 3) $26.2 \times \frac{12,000}{1,000}$	315
Net pressure	535

Pressure drop per 1,000 ft. equivalent 4½-in. (fluid friction) $= \frac{535}{22.2} = 24$ lbs. per 1,000 ft.

From Figure 3: Flow = 200 gals. per minute

A liberal factor of safety should be used in selecting pump liners on the basis of such figuring, since the steam pressure at the pump is likely to be considerably less than that at the boilers, and there is likely to be 20 pounds or more back pressure on the pump exhaust than could reasonably be expected.

Settling of Sand Grains in Mud

When mud is regarded as a solid, instead of a liquid, many of its properties are easily understood. For example, there is for each mud a minimum size of sand grain that can settle out. Any grain smaller than this minimum size does not have sufficient force per unit area due to its weight to shear the mud, and so cannot settle any faster than the clay particles. Dilution of the mud allows such grains to settle by reducing the "yield point." This has nothing to do with flow, but is mentioned as a matter of interest and to bring out the nature of the physical properties assigned to mud in the foregoing discussion.

The data given herein have been taken on California muds, chiefly those used in the Kettleman Hills Field. Muds used in other districts may have different properties which should be determined before attempting to apply the method to them. The material is offered rather as illustrative of a useful line of thought than as a finished piece of work, with the hope that it may be developed by wider application.

TABLE 1—EQUIVALENTS

Feet of Drill Pipe Equal to Equipment Below. Compute Friction Only—No Shear

Size, in.—		Tool joint	Bit 2:⅝ in.	Bit 2:⅞ in.	3-in. pipe 1-hose	3½ in. × 33 ft.	Kelly stems— 6 in. × 51 ft.	6 in. × 33 ft.	6½ in. × 33 ft.
2⅜	4.8	67	124	100	28	280	55	45	19
	6.65	43	79	62	17	175	35	29	12
2⅞	6.45	80	340	270	86	770	152	125	54
	8.35	60	260	210	57	575	113	93	40
	10.4	39	158	134	39	375	74	67	26
3½	8.5	125	545	324	217	1,640	338	254	125
	11.2	95	410	244	166	1,220	255	189	95
	13.3	71	310	183	130	970	192	142	71
4½	95	2,050	1,250	796	.....	1,130	835	448
	13.75	93	2,000	1,170	757	.....	1,110	810	437
	16.6	76	1,630	960	641	.....	900	665	358
5 9/16	100	5,720	3,350	2,300	.....	3,140	2,320	1,250
	22.2	82	4,700	2,750	2,050	.....	2,580	1,910	1,030
	25.25	78	4,400	2,600	1,805	...	2,440	1,810	975
6⅝	118	14,500	8,550	6,020	....	8,000	5,900	3,180
	25.2	107	13,100	7,720	5,540	.....	7,230	5,320	2,870
	31.9	90	11,100	6,500	5,150	.....	6,120	4,500	2,440

Feet of Drill Pipe Equal to Each Foot Between Pipe and Casing of Sizes Indicated. Compute Fluid Friction and Shear

	5⅝ in.	6⅝ in.	7 in.	8⅝ in.	9 in.	11¾ in.	11⅞ in.
Fluid friction	0.039	0.0132	0.0081	.....	.....	.....	.....
Fluid friction	0.024	0.0078	0.005	.....	.....	.....	.....
Shear	0.76	0.58	0.52	.....	.....	.....	.....
Fluid friction	0.735	0.050	0.030	0.0008	.....	.....	.....
Fluid friction	0.545	0.037	0.022	0.0006	.....	.....	.....
Fluid friction	0.375	0.026	0.015	0.0004	....	.....	.....
Shear	1.16	0.81	0.73	0.50	....	.....	.....
Fluid friction	.....	0.295	0.149	0.029	0.0021	.....	.....
Fluid friction	.....	0.227	0.114	0.022	0.0016	.....	.....
Fluid friction	.....	0.179	0.090	0.0175	0.0012	.....	.....
Shear	.....	1.30	1.11	0.72	0.67	.....	.....
Fluid friction	.....	.....	1.68	0.205	0.137	0.019	.....
Fluid friction	.....	.....	1.60	0.195	0.130	0.018	.....
Fluid friction	.....	.. ..	1.36	0.165	0.110	0.015	....
Shear	.....	.....	2.29	1.31	1.10	0 64	.....
Fluid friction	.....	.....	.....	1.72	1.05	0.094	.....
Fluid friction	.....	.....	.....	1.55	0.93	0.083	.....
Fluid friction	.....	.....	.....	1.36	0.87	0.073	.....
Shear	.....	.....	.....	2.24	1.87	0.96	0.76
Fluid friction	.....	.....	.....	.....	106	0.38	0.085
Fluid friction	.....	.....	.....	.....	98	0.35	0.078
Fluid friction	.....	.....	....	....	83	0.30	0.067
Shear	.....	.....	.....	.....	4.03	1.47	1.03

TOTAL OIL DEMAND 93 PER CENT OF PEAK

(Continued from Page 15)

ever, did aid refiners in maintaining a healthier relationship between the supply and demand for other refined products. The ability to curtail the supply was fortunate as the demand for other major products showed a much larger decrease than in the case of motor fuels. In the case of kerosene there was a decrease in 1931 of 9.9 per cent in domestic demand and 24.7 per cent in exports. The domestic demand for lubricating oils decreased 7.1 per cent and exports decreased 18.2 per cent.

The decrease in kerosene and lubricating oil exports is in line with the decrease of 30.1 per cent in gasoline exports. A government authority in the case of gasoline says the decrease in exports was due both to the expansion in foreign refinery facilities and a decline in actual consumption, a development brought about by economic conditions. He estimates the two causes of about equal importance. It is probable that the same explanation can be given in the case of kerosene, lubricating oil and fuel oils.

The significant development in the case of kerosene and lubricating oil was the reduction in inventories despite the large loss in demand. Kerosene stocks at refineries at the close of the year were 22.5 per cent less than at the start and lubricating oil stocks 13.3 per cent less. The stocks of paraffin wax were reduced 22.5 per cent during the year due to an increase in total demand with a decline in production.

FUTURE OF THE OIL PRODUCING INDUSTRY

(Continued from Page 14)

the great local overproduction in East Texas, and the threatened breakdown of all measures of restriction were enough to ruin any price structure.

What About Reserves?

The present known fields of the United States are estimated to contain about 10,000,000,000 bbls. of oil recoverable by present methods at reasonable cost.[1] Consumption is about 920,000,000 to 1,000,000,000 bbls. per year. The known reserves, therefore, constitute about 10 years' supply at the present rate of consumption. Is 10 years' supply of raw material too much for the second largest industry in the United States?

Measures of Stabilization

Petroleum engineers have found that gas pressure is the force that makes oil production possible because it drives the oil out of the sand to the well. The theory has been advanced that though a man may have a right to all the oil he can drain through his well he has no right to waste or exhaust the gas pressure that would make it possible for his neighbor to produce the oil remaining beneath the neighbor's land.

The second factor is that a field should be operated as a unit and produced gradually, by which methods more oil will be secured than from a field produced ruthlessly. To quote Mr. Teagle, "One of the most potent possibilities in improving conditions in the future, lies in unit development of pools. . . . The trend is toward a common development of flush pools and this should do much to stabilize supply and demand."

External forces have been applied to prevent what would otherwise have been calamity. In Texas, Oklahoma, California and Kansas production has been brought into line with consumption by state restriction. The restriction in Kansas, Oklahoma and Texas has been harmonized by an informal interstate agreement, pending a formal interstate agreement, ratified by Congress, as advocated by the Federal Oil Conservation Board.

Voluntary restrictions have made the application of these external remedies possible and those with most at stake have stood almost solidly behind the officials who have imposed and enforced curtailment.

The effect of these various forces at work for the stabilization of the industry is shown by the results, as shown by the statistics herewith presented.

The Testimony of Prices

Another confirmation of the effectiveness of the forces at work in and on the industry is afforded by the action of crude oil prices as shown in Figure 4.

Former Crises

Figure 5 shows graphically conditions that have existed in the past as compared with the conditions existing in 1931 and indicate that in former years there has been an actual increase in production during flush years as compared with the year just past, while in 1931 5.2 per cent less oil was produced than in 1930.

The Prospects for Future Consumption

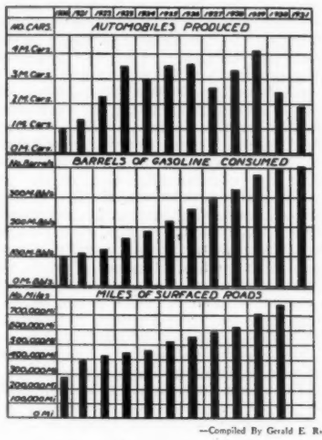
From 1870 to 1930 the consumption of oil per capita in the United States increased from 0.14 bbl. to 7.59 bbls., as shown by Figure 6.

If the rate of increase is maintained the consumption per capita in the United States by 1940 will be more than 9.5 bbls. Population will increase also. Consumption, then, is certain to grow.

At this point some one is sure to object that the production of automobiles has declined, and that gasoline consumption must decline accordingly. The argument sounds reasonable; suppose we examine it.

In 1930 automobile production fell off 38 per cent; in 1931 it fell off another 30 per cent. Did domestic gasoline consumption decline accordingly? It did not. In 1930 it increased 5 per cent; in the first 11 months of 1931 it increased another 1.9 per cent. Despite depression, unemployment and fewer new cars, the American use of gasoline continued to increase.

But if gasoline consumption is not proportional to automobile production, to what is it related? The answer seems to lie in mileage of good roads. The number of miles of surfaced roads in the United States increased from 521,950 in 1925 to 772,871 in 1930, an increase of 48 per cent. The increase in domestic gasoline consumption for the same period was 46



—Compiled By Gerald E. Rich

Figure 7—Automobiles, surfaced roads and gasoline consumption in the United States.

per cent. The correspondence in the two percentages is probably more than coincidental. We may or may not have reached the saturation point in automobiles, though probably not, but so long as we continue to increase the mileage of good roads our gasoline consumption will apparently keep on growing.

This gives the industry a bright outlook, for there are 3,000,000 miles of unsurfaced roads in the United States, and improving them is not likely to cease until a fair share of them are surfaced. We may look forward with confidence to a continued and rather rapid increase in gasoline consumption.

Year by year we obtain a bigger yield of gasoline from each barrel of crude oil, and this trend may be accelerated during the next few years, but it can scarcely keep within sight of the probable increases in gasoline use. Despite fire, swords and panics, therefore, it is safe to predict that oil consumption will increase at least 25 per cent, probably more, in the coming 10 years.

Airplane and Law of Multiplied Mileage

That good roads should determine gasoline use is not surprising when we consider the law of multiplied mileage. If the speed of man's travel is increased he will not cover the same mileage in less time and stay home the remainder of the time he formerly devoted to traveling about; on the contrary he will travel the same amount of time and travel farther. He does not divide his traveling time, he multiplies his mileage.

This was true in changing from horse-drawn to automotive vehicles; it has been true with every increase in speed through improvement in good roads or automobiles; it will be true with flying, by which man's traveling speed is again multiplied by three.

The number of registered planes in the United States is still small, 7,386 on June 30, 1931, but no one doubts that the number will increase in a rapidly mounting cruve. A plane uses from one to five times as much gasoline per mile as an automobile and goes three times as many miles in an hour. It is obvious that even a moderate rate of increase in planes will mean more than a moderate increase in gasoline consumption.

Summary

If our reasoning together has been correct, we may summarize our statements as follows:

The future of the oil-producing industry depends on (1) avoidance of overproduction and (2) maintenance of consumption.

1. As to overproduction:

(a) Overproduction is not chronic in the industry. In 7 of the past 11 years, including 1930 and 1931, we have consumed more oil than we have produced.

(b) The crisis last summer was not caused by overproduction but by fear of overproduction, due to unprecedented reserves and danger of unrestrained production.

(c) The known reserves are about 10 years' supply at the present rate of consumption, but could not be produced at that rate for anything like 10 years.

(d) To keep pace with consumption we must find 10 new major fields a year, which we are not now doing.

(e) New ideas, making for sounder and less hectic methods of production, are gaining ground in the industry, and will eventually remove much of the danger of overproduction.

(f) While these internal ideas are developing, external force, in the form of state regulation, is preventing overproduction, and voluntary curtailment is adding to the effectiveness of these restrictive measures.

(g) The industry has been free from overproduction for 20 months or more, as shown by withdrawals of crude oil from storage every month since March 1, 1930.

(h) In 1902, 1911 and 1916 the industry passed through crises as severe, in proportion, as that of the past year, and each crisis was followed by a period of high prices and a scramble for crude.

(i) The recovery of the industry since the crisis of last summer is shown by price increases of 300 to 700 per cent.

(j) The statistical position of the industry is the best it has been in years.

2. As to future consumption:

(a) Consumption per capita in the United States has increased from 0.14 bbl. in 1870 to 7.59 bbls. in 1930; it will probably exceed 9.5 bbls. by 1940.

(b) Consumption of gasoline is not dependent on automobile production but on mileage of good roads.

(c) Automobile production declined in 1930-31, but surfaced roads increased, and gasoline use increased also.

(d) Oil consumption should increase 25 per cent or more in the next 10 years.

Acknowledgements

I must acknowledge my indebtedness to Arthur Rich for gathering and compiling many of the data, and to Gerald Rich for preparing them in graphic form. The date presented is based upon statistics published by the Government, American Petroleum Institute, The Oil and Gas Journal, Engineering News-Record, World Almanac and similar sources.

[1] Wallace E. Pratt, director, Humble Oil & Refining Co., The Oil and Gas Journal, July 16, 1931, page 19.

THE ECONOMICS OF DOMESTIC MARKETING

(Continued from Page 17)

line. I have estimated roughly that these two factors might easily have resulted in an additional reduction in 1931 of one-quarter cent per gallon or more in some sections.

It would appear from this picture that there has been a fairly well established downward trend in the margins upon which the refinery and marketing branches of the industry operate. This undoubtedly is due, in part, to the generally declining price trend and the fact that gasoline prices decline ahead of crude oil, but that there also are at work more fundamental factors is evident from a study of the events of 1931.

Introduction of Third Grade

As previously mentioned, comment was made last year on the rapid growth of the nonconventional type of marketer operating so-called "trackage stations," and the like, selling at cut prices and often getting a large enough volume of business to make the operation profitable. To me this type of marketer presented a distinct challenge to the expensive type of marketing conducted by the average major company, and probably reflected the effect of a wider margin than could in the long run be maintained.

The early part of 1931 witnessed a still more rapid growth of this kind of marketer. The declining wholesale prices of gasoline gave him valuable ammunition; so did the depression, which gave many retail consumers a special interest in cut prices. Moreover, as in any developing activity, the technique of conducting price-cut marketing also was advancing. Such marketers were learning that they need not confine themselves entirely to low quality products but could exploit quality arguments as well. Some of them used low oil prices as an additional inducement; others charged regular prices for oil and so got a little extra margin. Above all, their boldness was increasing as they found they had less to fear from retailatory prices than they may have expected.

Suffice it to say that by the spring of 1931 the effect of cut prices had grown to proportions which major companies could no longer neglect or attempt to deal with purely by local price reductions of their regular brands. For one thing, these regular brands carried such wide dealer margins that retail price reductions soon brought the net price realized by the company on its dealer to a definitely unprofitable level. The cut-price marketers, however, typically sell only through their own operated outlets and consequently are not burdened with definitely fixed dealer margins.

Economic Forces

A belated recognition of the economic forces at work finally came with considerable suddenness in the late spring when one major company announced that it would market a third grade of gasoline at a price about 2 cents below that of its "regular" brand, and on which it would allow a dealer discount or agency commission of only 1 cent per gallon. Thus with a bold stroke the company was enabled to meet the demand for lower prices without having to give the dealer a margin wider than could be afforded.

At first there was much controversy over the wisdom of the third grade move, but whether from choice or otherwise, most major companies soon felt it expedient to adopt the plan, as otherwise, of course, they would be at a serious disadvantage unless they tried to reduce the prices of their regular brands below the level of the originating company. Gradually, however, the logic of the third grade as a strategic step bore in on most major companies and it has now been very widely adopted.

I should be inclined to give first place to the inauguration of the third grade of gasoline among the significant events of 1931. It marked the first official recognition of reduced total margins as an accepted fact. It marked also the first important attempt to reverse the trend of dealer margins.

Loaning Equipment

Another of the developments of 1931 which deserves note was the tendency toward discontinuing the loaning of equipment. The practice of oil companies of furnishing dealers and consumers with pumps and tanks free of charge grew up in the days of wide margins and intense competition for outlets. Once the practice became established no one dared discontinue it lest he be at a competitive disadvantage in securing further dealer business. It is only when a more or less common conclusion has been reached as to the unsoundness of such a practice that anyone is willing to risk discontinuing it in the hope that others may have the courage and wisdom to follow. The year 1931 presented certain opportunities in this direction with respect to the loaning of equipment. The general unsoundness of the practice and the ridiculousness of the companies themselves furnishing capital for still more dealer outlets had become pretty well recognized, but equally important was the fact that the heavy losses sustained by most companies in 1931 made them more receptive to cash conserving possibilities.

During the year, therefore, a number of the major companies in various parts of the country announced their decision to discontinue the loaning of equipment, usually with certain specified exceptions. The extent to which their example has been followed has varied in different lo-

calities, but on the whole it has, I believe, been gratifying rather than disappointing. It is possible, therefore, that in respect to this wasteful practice, 1931 may have marked another turning point and a trend toward sounder marketing. More likely, however, it merely represents one of the inevitable effects of narrowing margins, for when we have less to give away, we give away less.

Improvement in Antiknock Qualities

One ought not to pass over 1931 without taking note of the progress that was made during the year in antiknock quality of gasoline and in the measurement thereof. Up to 1930 there had been relatively little attempt to give high antiknock value to regular priced gasoline. But as the importance of antiknock became better understood and as automobile manufacturers went to higher compressions, the opportunity to capitalize on "antiknock at regular price" became increasingly tempting, and one company especially adopted it as a fixed policy. The movement grew and in 1931 many companies took definite steps to secure higher antiknock qualities in their regular priced gasoline. The development of the octane number rating of antiknock quality early in 1931 answered a long-felt need for a definite standard of measurement. In the wholesale market the octane scale already has been adopted as the basis for more or less definite price differentials. The present octane basis has certain shortcomings and it is possible that further research will result in some changes, but at all events it marks a notable advance from the measurements which existed prior to its adoption.

The improvement in antiknock quality of ordinary gasoline was, of course, an inevitable development, but probably it has not been given its due credit for influencing margins. On these, it has, I believe, had a threefold effect. First, it reduced the percentage of sales of premium price gasolines, on which wider margins existed; second, it increased the cost of manufacture without any corresponding increase in price; and finally, it helped to promote the third grade because it forced refiners to use their best antiknock material for their regular grade, leaving more inferior antiknock materal than they could utilize in the ordinary course of sales. The third grade provided a market for some of this material, but only a definitely lower price relative to refinery costs.

Other Automotive Products

The year 1931 witnessed also a growing tendency of oil companies to take on the merchandising of other automotive products. A large proportion of the major companies officially began selling tires of one brand or another and some have gone or are going into batteries. In addition to these rather staple necessities, many companies are experimenting with other accessory items. There possibly is a tendency also to try to increase the sale of other revenue producing services such as washing, polishing, etc., in addition to lubrication. It is too early to determine to what extent these developments may influence the course of petroleum marketing or furnish present outlets with enough new net revenue to take the place of what is being lost because of generally lower margins on gasoline and oil and definitely declining motor oil sales. I think we may say, however, that while further developments may be expected along these lines, they will not be panaceas, for unless handled with extreme care they are likely to increase expense, both seen and unseen, which may or may not exceed the revenue they produce.

Changes in Motor Oil Picture

The reference just made to declining motor oil sales suggests consideration of various developments in the motor oil picture during 1931 affecting both sales volume and price.

During the past decade or so the prices of crude oil and of practically all its products, except advertised brands of motor oil, have declined by more than 50 per cent. That the price of branded motor oils should have remained unchanged and even increased in many cases during this period is perhaps an economic curiosity. Doubtless it is attributable in considerable measure to advertising, for on few products so staple as motor oil has there been, I believe, a higher percentage of advertising expended. Of course, this advertising alone could not have kept prices up; there have been notable improvements in the quality of motor oil which have made it more valuable; then the fact that the expenditure of the average motorist for motor oil is relatively very small has resulted in little pressure for price reductions on his part.

Generally speaking, too, the consumer has recognized the fallacy of saving money by buying cheap oil only to lose it many times over on extra repair bills. This fear of consequences, therefore, has made him willing to pay extra for the assurance of high quality which he naturally associates with higher prices. The psychology of the oil industry, moreover, seems to have been that oil is largely the antithesis of sugar in the grocery stores. Sugar, you know, commonly is supposed to be sold without any profit, but the petroleum marketer seemed to feel that considering the declining price of gasoline and of the profit thereon, the little extra velvet he got on motor oil was quite justified.

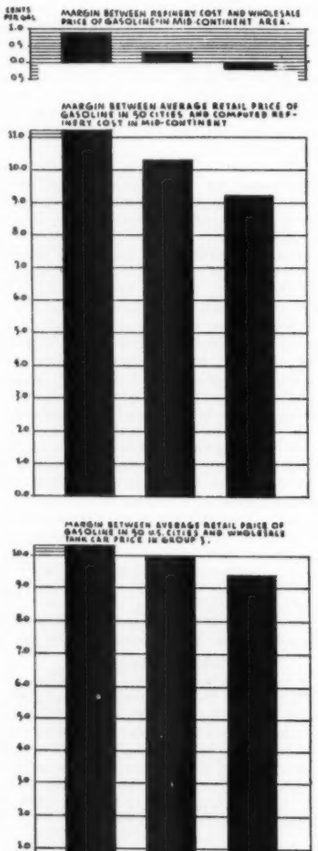


Figure 2—Price of gasoline in relation to some other costs.

The consumption of gasoline in 1931 held up very well. The motorist cannot skimp on it and still drive, but unfortunately this is not true of oil. Between the quantity of oil one possibly should use and what one can get by with in a pinch is perhaps the difference between 2 and 1. I think the ratio of oil sales to gasoline of most oil companies in the latter part of 1931 would indicate that not a few motorists had decided to buy oil on this theory. The improved quality of oil and of the oil systems in the modern automobile, of course, also have tended to reduce the ratio of oil to gasoline.

Price an Equation

Under the theory that price is an equation of supply and demand, it would be natural to expect that the reduced consumption or demand for motor oil without, certainly, any corresponding reduction in the supply, would tend to force down the price. I am afraid that the facts in 1931 have borne out the law.

Even before 1931 the price of motor oil had been cut in various ways—some cut-price stations gave away 1 or 2 quarts of oil with every 5 gallons of gasoline, others, including various major companies, occasionally sold oil at reduced prices in 5-gallon cans. The year 1931, however, saw a rapid development of the various price cutting devices. Early in the year the so-called "squatters" appeared in great numbers in and around Detroit—people equipped with a few barrels of oil on a vacant lot, along the curb side, or out on the highways, selling oil at 10, 12½ or 15 cents a quart. A good deal of their oil was said to be 100 per cent pure Pennsylvania oil.

The mail order houses, the department stores, automotive supply houses, hardware stores, and the like, increasingly have been featuring oil, usually of alleged high quality, at prices of 50 to 60 cents per gallon. The cut-price type of gasoline marketers, to a large degree, have met the low oil prices, but few of the major companies have as yet done so except through the sale of oil in 5-gallon cans at a discount.

There is no question, I think, but that the major companies have suffered a considerable diversion of oil sales into other and somewhat artificial channels of distribution. I say artifical because I do not believe that the average motorist prefers to buy his oil through a mail order house, a department store, or a hardware shop, for any reasons of convenience.

Some of the major companies have reduced their regular oil prices from 35 to 30 cents or from 30 to 25 cents, but these reductions probably do not really reach the type of competition we have been describing. A few majors, however, recently have come out openly with third grade oils, selling at 15 to 18 cents a quart. We probably will see an extension of this policy among other majors, both as a means of meeting the cut price competition from other channels of distribution, and as a defense against the competition from majors who already have adopted the policy.

There are many difficulties involved in readjusting the established wholesale and retail price structure on motor oil to lower levels, and considering the millions of dollars that have been expended in trying to educate the public to the wisdom and economy of buying oils on a quality and not a price basis, it is not strange that there should be much hesitation before deserting the status quo. Nevertheless, an industry which has such a tremendous investment in convenience outlets and facilities cannot regard with complacence the diversion of a large part of its business to other channels simply because of differences in price.

I would set 1931 down, therefore, as marking the conclusion of a certain era in the history of motor oil; a year in which a certain disillusionment began—an unmistakable warning that in motor oil, as in gasoline, the dreary march toward narrower margins has commenced.

Courtesy Cards

There is one more event in 1931 which I should like to mention—the courtesy card credit experience in Texas. According to reports, about one-half the gasoline sold at retail in that area at the present time is on a credit basis. This came about, presumably, because some company found it could increase its business by distributing so-called "courtesy" cards in wholesale fashion. Other companies felt impelled to follow suit and so the practice became general. About one-half of the collections are reported to be constantly in arrears and large sums continually are written off. Imagine the cost of collection and losses, to say nothing of the bookkeeping expense—the cost of these items is estimated at 1½ cents a gallon.

Does anyone claim that this is a sound practice, that it represents a justifiable use of credit, or that the industry serves the public well by adding 1½ cents a gallon to the cost of distribution? I think the answer almost unanimously would be no. If there were a court of economic justice, this probably would be held an economic crime against society. As it is, the practice doubtless will run its course like a bad disease until everyone is so thoroughly sick of it that they will welcome a proposal to quit. Then the people now devoted to keeping accounts and making collections will be dismissed and the expensive bookkeeping machinery that has been purchased thrown into the discard.

Who was responsible—the misguided company that started the practice, or the companies that blindly followed on the grounds of expediency? Both, I think.

Ramsay McDonald, when he visited this country in the interest of armament reduction, said, "we must take some risks for peace as well as for war." I am inclined to think that individual business must take some risks for economic soundness. Suppose, for example, that when the courtesy card evil in Texas began, one of the stronger companies, after analyzing the practice, had said, "it is unsound, therefore we will not follow it—if the company or companies now resorting to it believe that there is an extra 1½ cents in the margin to throw away or use in attempting to get new business, we believe that that 1½ cents might better be utilized in the form of a direct price reduction than to provide the customer a service he does not need or really want, and which in the long run will do him harm because of its expense and its discrimination against cash customers in favor of those who buy on credit but fail to pay."

I realize that this suggestion would open up a great deal of argument, and be called highly theoretical. Nevertheless, I am convinced that businesses too often follow admittedly unsound practices simply because it is the course of least resistance, when by a little clearer thinking and a more unswerving purpose they could devise means of offsetting the advantage of the competitor who started the unsound practice by hitting directly and immediately at the implications of the practice, and thereby avoid the expense of building up of a false and unsound mechanism for getting to the same point a month or six months later.

I am simply raising the question of when and under what conditions the conclusion that a practice is definitely and admittedly unsound might be deemed ipso facto a sufficient reason for deciding not to follow it.

Conclusion

I am afraid that this paper has a rather evident theme song of declining margins, which, if true, might seem to indicate a rather pessimistic outlook. If properly interpreted, however, I do not think there is any more occasion for pessimism than there would be in recognizing that we must conform our activities to the law of gravity. What I mean is that there are at work at all times economic forces which if sufficiently well understood and observed probably would be found almost as constant and immutable as the law of gravity; though not necessarily so prompt in their operation.

In the oil industry many of the basic difficulties in the production end arise from man-made laws, as well as natural economic forces. To the extent that the trouble is man made, I can see no reason why it cannot be corrected by unmaking or undoing the man made evils. Certainly, too, much, if not most, of the difficulties in the marketing end arise out of the production situation, and to the extent that marketers can aid in eradicating unsound man made laws in the production end, they can of course help to improve the foundation upon which the supply factor for their end of the business rests.

Under any given set of supply conditions, however, there probably is little that any individual company can do to influence price in any real or lasting sense. The ability of someone else to market a product more economically than you can do so will have far more influence on price and on margins than anything you might do to try to maintain a given price. To my mind, there-

fore, our problem is not how to maintain prices and margins that will enable us to proceed profitably on our present basis of marketing expense, or even worse, on increased marketing expense—that we cannot do unless our marketing expense is sound, for we have no monopoly on the marketing of petroleum products. Our problem rather is to find out what is a fair price based on economic realities, accept that price and the margin it results in, and then if possible adjust our marketing expense to that margin if it is not already in adjustment. If we cannot adjust it, we probably would be wise to conclude that we were not cut out for this particular business. If, for instance, we see some other business, such as department stores, selling oil at half our retail price and in their opinion still making a satisfactory profit on it, what shall we conclude? That the department store does not know its marketing cost; or that it is just trying to be mean; or that the extra service and convenience we provide is worth the difference in price even though many customers do not agree; or that we need extra profit on oil to make up for a loss, say, on gasoline, and hence that the department store ought not to be allowed to sell oil unless it also sells gasoline; or that our own price may be out of line with a reasonable cost of distribution?

I am, indeed, convinced that the margins on gasoline and oil are likely to decline further, as more economical methods of marketing supersede some of the present methods. Certainly no one would claim that the present system is very economical or efficient. Neither could they deny that there is nothing to stop anyone from trying to make a profit by doing the job more cheaply and charging lower prices.

Revolution in Distribution

We are, in many respects, I think, passing through an industrial revolution in distribution. For years we have heard the cry that the cost of distribution is too high and that it must come down. What we sometimes overlook is the fact that in many cases it is coming down, as, for instance, in the grocery field where the chain store systems are performing both the wholesale and the retail functions for less than it formerly cost the retailers alone to do business. This means a saving of about 11 cents per dollar's worth of sales, and represents a reduction in the cost of distribution itself of approximately 40 per cent. In other words, for 60 cents the chain grocery stores of today are accomplishing what it formerly cost the wholesale and retail grocers $1 to do. Considering that the average grocery store is operated on about one-half as much expense per dollar of net sales as is a gasoline station, it may not be unreasonable to expect that the cost of the latter will be reduced.

It seems to me that the experience of 1931 indicates that if the companies now enjoying most of the country's gasoline and oil distirbution are to hold their relative position, they must guard against two things: First, the attempt to charge higher prices than can be maintained without diversion of worthwhile business to other types of outlets or other kinds of marketers, for it is easier to lose such business than to recover it. In the second place, I believe they must guard against subdividing their business among still more outlets. There is no greater fallacy than for each and every important company in an industry to assume that by each increasing its number of outlets each can increase its total sales. The one thing we can be sure of under those conditions is that as a whole these companies will increase their marketing expense per unit and will therefore be more vulnerable than ever to attacks of price cutters.

To my mind, therefore, the healthiest thing for the marketing end of our industry to do would be to accept the inevitability of lower margins and try to anticipate their arrival by getting its marketing expense in line, get rid of the outlets which cannot pay their own way, and abandon completely the practice of loaning equipment to anyone who wishes to become a dealer. I appreciate, however, that no industry is likely to rationalize itself as a whole except possibly for brief intervals under the stress of some special emergency. As an industry, therefore, I suppose we are not likely to move toward sound marketing practices much faster than such practices are forced upon us by the coercion of economic developments. There would seem to be no reason, however, why this should diminish the value of foresight to any individual company.

NO INJUNCTION ISSUED IN EAST TEXAS FIELD

(Continued from Page 13)

Sec. 36. "No power of suspending the laws in this State shall be exercised except by Legislature."

Having in mind the great issues out of which these constitutional provisions grew, the courts of Texas have never faltered in straitly upholding them. Men learn but to forget, to learn and forget again. Sometimes they learn their lessons at such price of sorrow and shame, of bitterness and anger, that graven on their hearts the lessons lie, deep deyond forgetting. At such times men yearning toward their posterity write these lessons down as imperishably as they may go that they may stand as the Lord's remembrances, to save their children from like passion and travail. Of this kind are the constitutional provisions above set out. They were written into the fundamental law by men who had suffered under the imposition of martial law during Reconstruction in Texas. These provisions had their origin under practically the same conditions which wrote into the English Bill of Rights limitations on the power of the king to suspend the laws. Their authors had petitioned the Congress of the United States for relief in vain. In every convention, in every gathering assembled, protecting the suppression of free speech, the interference with the processes, the judgments and decrees of courts, they had denounced these tyrannous acts and sought relief from them, and when they met to adopt the Constitution of 1776, which still obtains, they determined to and they did so write the fundamental law that such deprivations of liberty might not occur again.

Constitutional Question

One of counsel for the defendants urges that here is no case of suspension of laws, no case of deprivation of due process. Here is due process, the exertion of the power of police. That the exercise of such power inherent is government violates neither the Constitution of the State nor of the United States. The argument begs the question.

Certainly if the actions of the governor and of his subordinates here complained of are valid exercises of the police power of the State, they are not contrary to, they accord with, they do not violate, they conform to, the law. On the contrary, if they represent attempts to exercise police power not conferred upon the governor, they are invalid under both Constitutions. The police power is subordinate to the Constitution, as is every other power of government. It may be exercised only when and by whom the Constitution authorizes its exercise, and in the judicial branch of the Government alone resides the power to determine whether it is being exercised. Without variableness, neither shadow of turning, the courts of Texas down to this very day, mindful of the occasion, the purpose, and the meaning of these constitutional safeguards, keeping faith with them, have kept the Constitution paramount.

Calling Troops Civil Matter

When the governor calls out the troops in Texas he calls them out, not as a military, but as a civil officer. The powers and duties are derived from, they must be found in, the civil law. At no time and under no conditions are their actions above court inquiry or court review.

This does not mean, of course, that the military, acting as peace officers, may not in emergencies exercise summary power. They may; but so may peace officers. "Measures are sometimes necessary under the police power that are severe." 148 Fed. 876. But these measures referred to were not military, they were civil measures taken in and justified by necessity. If we were without direct authority for these views, they would command themselves to us as the only ones in accord with the genius of a government like ours. The view we take, however, has received positive and authoritative sanction first in the courts of Kentucky, the "dark and bloody ground," where men learned both to love and to know liberty, and by adoption afterwards in Montana, North Carolina, Michigan, and Oklahoma. Frank vs. Smith, 143 Ky. 232, lays down, we think, with precision and power the rights of the governor of a state, in the calling out and use of the militia. His unquestioned right to call it out is conceded. That his and the militia's status when called out in that of civil officers, whose only power must be found in civil laws, and that they are always subject to those laws, is declared in no uncertain terms.

Kentucky Case Cited

There the difference between the unquestioned right of the governor to call out the militia, which all the authorities concede, and his right to erect himself and them above the law, giving them super power, is set out. That court in terms rejected the doctrine, as applied to Kentucky, held in In Re Moyer, Commonwealth vs. Shortall, 206 Pac. 165, that civil emergencies requiring the calling out of troops may be declared to be a state of war, and a military government may then ensue. Upon those points it said:

"It must nevertheless be kept in mind that in the exercise of the power to call out troops the Governor acts in his capacity as a civil officer of the State and not as commander in chief of its army. As the chief civil magistrate of the State he calls out and must direct, in accordance with law, the movements and operations of the military force. 'The military shall be at all times and in all cases in strict subordination to the civil power.' It is so written in Section 22 of the Bill of Rights. We have not, and cannot have, in this state a miliary force that is not and will not be subordinate to the civil authorities. The military cannot in any state of case take the initiative, or assume to do anything independent of the civil authorties. Ours is a government of civil, not military forces. The militia in active service and in every emergency that arises in such service is subordinate to the civil power. The soldier and the citizen stand alike under the law. Both must obey its commands and be obedient to its mandates. . . . We are not willing to concede that in any exigency that may arise the military is superior to the civil authorities, nor do we believe that the time will ever come when the military forces of the state, acting under and in obedience to the civil laws of the state, will not be able to control under the authority conferred by these laws any situation that may present itself."

And further:

"After mature consideration we have reached the conclusion that any military order, whether it be given by the governor of the State or an officer of the militia . . . that attempts to invest either officer or private with authority in excess of that which may be exercised by peace officers of the state is unreasonable and unlawful." . . . "We . . . hold as a matter of Law" that the orders of the military "are confined to such as a peace officer in the discharge of his duty might execute. What one cannot do, neither can the other; what one may do, so may the others."

No Arbitrary Power

Again:

"On the other hand, to say that the state militia acting in obedience to military orders may commit any act that may suggest itself to the commanding officer as being necessary to restore peace and quiet, although such act may be a greater violation of law than was committed by the person it was visited upon, would place the militia above the civil authorities, and give to the soldier powers not conferred upon the civil officer charged with the duty of enforcing the law. The command of the officer would take the place of statute, and there would be no limitation upon his conduct except such as his judgment and discretion might dispose him to adopt. We can find no warrant, either in the Constitution or statute . . . for investing the military forces of the State with arbitrary power like this."

And, finally, pointing to the full power existing under the statutes of Kentucky and at common law in civil officers to mere emergencies, it declares:

"There is no occasion for, there cannot be, the erection in any part of Kentucky of a military government."

This case has been accepted as authority, its principles fully quoted and applied. Recognizing as it does, the universally accepted view that martial law is the law of actual military necessity, in the actual presence of war, it is administered by the general of the army and is in fact his will. Martial law is founded on paramount necessity. It is the will of the commander of the forces. In the proper sense it is not law at all. Re Ezeta, 62 Fed. 972. "The will of the military chief is, subject to slight limitations, the law of the military zone." State vs. Brown, 45 L.R.A. (NS) 909. it declares that the governor of a state may not by proclamation, bring about such a condition of civil anarchy. It but declares and reaffirms the doctrine fixed beyond cavil and for all time by the Milligan case, that martial law and civil law are mutually contradictory; they may not co-exist. That martial law cannot exist where there is no real state of war, where the ordinary tribunals are functioning and orderly courts are run. That under constitutions like ours in time of peace such military dictatorships may not be established by military fiat.

Courts May Not Be Closed

We accept these principles in their fullest implications as principles obtaining in Texas under her Constitution and laws. We hold with the Supreme Court of Montana in Ex Parte MacDonald, 143 Pac. 947, that under the Constitution of Texas courts may not be closed, or their processes interfered with by military orders, that courts cannot be ousted by the agencies detailed to aid them, or their functions transferred to other tribunals unknown to the Constitution; with the court in Herlihy vs. Donohue, 161 Pac. 164, "The governor is at all times amenable to the Constitution and laws of the State. They are the charters of his power and in them he must find the authority for his official acts." And that "while at times, within the narrow limits of actual and pressing necessity, private property may be taken and destroyed for the public good, in every instance where such right has been exercised and questioned the decision upholding the right makes it clear beyond controversy that only the most overriding necessity will justify or excuse"; with the Supreme Court of West Virginia in Ex Parte Lavinder, 108 S.E. 428:

"Martial law is a drastic and oppressive system. Under it the rights, privileges and liberties ordinarily possessed and enjoyed by citizens are greatly restricted and abridged, and the powers of the military officers are infinitely larger

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Note 1.—"The police power is subordinate to the Constitution as is every other power of government. If this were not so the result would be to subject the citizen's property solely to executive authority, putting it beyond the protection of the courts and depriving the courts of their essential power to determine what under the written law was lawful and what was not. Declaring the law of the land and adjusting property rights accordingly." Stockwell vs. State.

Note 2.—"The substantial value of property lies in its use. If the right to use be denied, the value of the property is annihilated and ownership is rendered a barren right. The police power is a grant of authority from the people to their governmental agents. . . . In its nature it is broad and comprehensive. . . . While this is true, it is only a power, it is not a right. The powers of the Government under our system are nowhere absolute. The fundamental rights of the people are inherent, and cannot be yielded to governmental control. . . . Constitutional power can never transcend constitutional rights.

"The police power is founded in public necessity, and only public necessity can justify its exercise." Spann vs. City of Dallas, supra.

than those conferred upon the civil officers. Hence it ought not to be put into effect except upon occasions of dire and inexorable necessity. Limitation of the power of the governor to invoke and apply it only on occasions of actual warfare and within the area of actual hostilities renders it impossible for him to set aside the civil laws and rule by his practically unrestrained will under any other circumstances."

Fourteenth Amendment

We agree with Judge Symes in United States vs. Adams, 26 Fed. (2d) 141, that if the governor of this State can do what he here asserts "it logically follows that the protection of the Fourteenth Amendment is a matter of favor only, depending on the whim of the governor, and not an absolute right."

We agree with Judge Nuessle, then District Judge, now Justice of the Supreme Court of North Dakota, in the views expressed by him when, granting an injunction restraining the governor of North Dakota, acting as the chief executive, and commander in chief of the military forces of the State, from taking over and operating coal mines in that State upon the grounds of public shortage and necessity, he said:

"It is not so material that this court shall pass upon the propriety of the executive declaring martial law. As I read the authorities there is no occasion for martial law unless the courts themselves have been so incapacitated by reason of the circumstances existing and calling forth a declaration of martial law, that they are unable to function. The reason for martial law is the necessity to rehabilitate the courts, not to destroy them or usurp their powers." Bruce "The Non-Partisan League," pp. 134 to 139.

The writ of prohibition and injunction applied for by the governor to the Supreme Court was, in State ex rel Governor Frazier vs. Nuessle, D. J., by a divided court denied. Opinions were filed but not reported. The dissenting opinion of Bronson, J., cites the authorities upon which defendants rely.

Cannot Bring About State of War

We have found no case, we have been cited to none, supporting a view contrary to that which we take here that under a Constitution like ours a governor may by proclamation bring about a state of war. It is true that some of the decisions in their generalization lend color to this view. An analysis of the decisions will show, however, that that color is spurious. The confusion with which the subject under investigation by us is invested has arisen, not from what has been decided in cases, but from what has been said in them, from an attempt to follow, not stare decisis, but stare dictis. None of the so-called martial law cases cited to us, and only two that we have found, State Ex Rel Governor Frazier vs. Nuessle, Dakota Coal Co. vs. Frazier, 283 Fed. 415, temporary injunction granted, declared moot and reversed in 267 Fed. 133, have dealt with a situation even remotely resembling the one involved. Therefore none are authority for our views, except as the general principles asserted in them furnish analogies for our course.

In the examination which we have made of them we have found that, however they may differ in argument and result, one general principle runs through them from the Borden case to the Lavinder case: That dire necessity and dire necessity alone, the necessity of self defense, suspends ordinary constitutional guaranties, and that where that necessity does not in fact exist no such suspension occurs.

West Virginia Cases

In West Virginia, whose cases are most strongly relied upon by the defendants, Judge Poffenbarger in Ex Rel Mayes vs. Brown, 45 L.R.A. (NS) 997, and in Re Lavinder, makes this crystal clear. In the first case, which was a case involving long continued, desperate, and dangerous violence and disturbance, he declares:

"It is said that the proclamation of martial law ousts or suspends the civil jurisdiction. These expressions are hardly accurate. The invasion or insurrection sets aside, suspends or nullifies the actual operation of the Constitution and laws. The proclamation of martial law simply recognizes the status or condition of things resulting from the invasion or insurrection, and declares it."

In the second case, although in West Virginia the governor by statute has the power to declare a state of war (See Mayes vs. Brown), Judge Poffenbarger, on the authority of the Milligan case, refused to permit proclamation to take the place of fact, saying:

"The substitution of the military for the civil law in any community is an extreme measure; socially, economically and politically it is deplorable and calamitious. Its sole justification is the failure of the civil law to operate and function. For the time being, by reason of the paralysis or overthrow of its agencies, the consequences of an insurrection, invasion or other enterprise, hostile to the State and resulting in actual warfare . . . it is perfectly manifest that the proclamation of war did not ipso facto inaugurate martial law in Mingo County. The governor's attempt to inaugurate and put it in force in that county, in the manner hereinbefore described, is therefore futile and inoperative."

In none of the state cases on which the defendants rely was there any theoretical, there was serious, in some of them desperate and prolonged riot, destruction of property, and carnage. The decision of the court in each instance was based upon the existence of those facts, and the language of the opinions must be read in that light.

Federal Cases

The Federal cases cited, none of which, except the Wolters case, are Texas cases, may be briefly disposed of.

Luther versus Norden arose before the passage of the Fourteenth Amendment. It was a damage suit involving an arrest made during the rebellion and civil war in Rhode Island, under the authority of an Act of the Legislature declaring martial law, and directing the taking of extreme action. The two Moyer cases were civil rights cases. They did not decide, the Supreme Court of Colorado did not decide, that the governor of Colorado had authority to declare martial law. U. S. vs. Adams, 26 Fed. (2d) 143. "We therefore reach the conclusion that independent of the questions of the authority of the governor to declare martial law, the petitioner, on the showing made by the return, is not illegally restrained of his liberty." Re Moyer, 85 Pac. 194. They decided merely that the Supreme Court of Colorado, having found Moyer's arrest unlawful under the laws of that State, and the petition not negativing the good faith of the arrest or showing abuse of power, no lack of due process, no deprivation of civil rights, was made out by him.

The Fischer case, 280 Fed. 210, was disposed of in the assertion, as to the correctness of which no state authority was cited, but which we accept, that under the laws of the State of Nebraska the governor had the power to declare a state of war and initiate martial law in that territory. If these assumptions as to the law of Nebraska are sound, plaintiff was not deprived of his civil rights.

Wolters Case

The Wolters case, 268 Fed. 70, another civil rights case, was on a petition for writ of habeas corpus, opinion by Judge Rufus Foster of Louisiana while sitting in the Southern District of Texas, for release from imprisonment in default of payment of fine imposed by a military court set up in Galveston after martial law had been proclaimed, and some of the civil magistrates had been removed from office, and a military court set up in their stead.

In this case the relator conceded away the point at issue here, whether the governor could by proclamation, declare martial law. On page 71, the court said, "I must conclude that the governor had complete authority to institute martial law in the city of Galveston. That is conceded by the relator." From that erroneous conclusion, induced, certainly aided, by the concession, the learned judge proceeded to conclude that the governor could do anything necessary to make his proclamation effective. That case correctly decided "the question whether there was riot or insurrection or breach of the peace in one solely for the governor, and that the courts will not interfere with his discretion in that and will not inquire whether or not the facts justify it." It incorrectly assumed in the governor in addition to that unquestioned power the existence of the stupendous one asserted here, the power to by proclamation, set aside the laws and institute a military government in place of a civil, a power not only not granted, but forbidden to the governor of Texas.

Troops Only Civil Officers

Upon a consideration of the whole case we hold not that we may, or that we do, inquire into the propriety of the governor's calling out the troops to enforce the law, but that they were called out to act as civil officers, with no greater power than civil officers would have, that in their actions they are amenable to inquiry, as civil officers are, and that neither the proclamation of martial law, nor the purported military character of the actions constitutes any defense to plaintiffs' suit. That defendants Jacob F. Wolters, R. S. Sterling, and W. W. Sterling have been without warrant of law interfering with and illegally depriving plaintiffs of their undoubted right to operate their own properties in a prudent and reasonable way, and in accordance with the laws of the State, and that from further interference, pending the final disposition of this suit, they must be enjoined.

Conservation Law Upheld

It does not follow, however, that plaintiffs may have their injunction without terms. For though the pursuit of the ignus fatuus, martial law, with its claims of military necessity and action in extremis has caused all parties to this suit to lose sight of the real, the fundamental facts which the pleadings and the evidence present, and of which we may take judicial knowledge (Henderson vs. Comm. —— Fed. (2d) ——) we may not do so. These facts are that the East Texas oil field is of great extent, and if proper measures are taken to safeguard against waste of oil and gas stored there, it has enormous production potentialities. That it is the consensus of informed opinion, with which plaintiffs do not disagree, that the general operation of wells in that field to their full capacity would result in actual physical waste of oil and gas, and injury to the strata in which it is confined. That before the taking over by the governor, upon the ground of military necessity, of the wells in the field the Railroad Commission, the statutory agent of the state for the administration of its conservation laws, had undertaken the duty of and was determining the amount of oil which might be taken daily without waste, and but for the action of the governor in ousting it from the exercise of its jurisdiction, it would still be doing so.

We have held in MacMillan vs. Comm. 51 Fed. (2d) . . . and Henderson vs. Comm. —— Fed. (2d) —— that the State of Texas has the power to conserve its resources of oil and gas and prohibit the waste thereof. That the commission is the body charged with the administration of those laws, and that its orders issued in pursuance thereof, are prima facie valid. This case began with a complaint against the commission's orders, as to which no evidence has been offered.

Awaiting Evidence

It is true that the orders of the commission have expired, and that we are without the guidance of their findings

CALIFORNIA CRUDE OIL PRICES

(Continued from Page 85)

ASSOCIATED OIL CO. PRICES

Associated Oil Co. prices effective June 20 are as follows:

Ventura Avenue, 22 gravity, 53 cents, with 2 cents added for each degree upward to and including 30 gravity, which is 74 cents.

Kettleman Hills—The Associated Oil Co., effective at 7 a.m. February 5, 1932, withdrew and canceled any and all prices heretofore published and in effect for Kettleman Hills oil.

Potrero, 24 gravity, 69 cents, with 2 cents added for each degree upward to 34 gravity which is 69 cents.

General Petroleum Co. in Kettleman Hills, effective January 1, 1932: 33-33.9 degrees, 66 cents; 34-34.9 degrees, 68 cents; 35-35.9 degrees, 70 cents; 36-36.9 degrees, 72 cents; 37-37.9 degrees, 74 cents; 38-38.9 degrees, 76 cents; 39-39.9 degrees, 78 cents.

UNION OIL CO. OF CALIFORNIA

Crude Oil Prices for Its Purchases at the Well for Crude Produced in Strict Accordance With the Production Allocations Made by the California Statewide Curtailment Committee Effective 7 a.m., June 20, 1931

(All gravities above these quoted take highest price for that field)

Gravity °A.P.I.	Signal Hill	Alamitos Heights Seal Beach	Huntington Beach	Athens, Rosecrans, Dominguez	Torrance	Santa Fe Springs	Playa Del Rey* E. Coyote	Richfield	Montebello	Santa Paula	Orcutt	Coalinga	Lost Hills	McKittrick, Kern River, Sunset-Midway, Elk Hills, Buena Vista Hills	Gravity °A.P.I.
11-13.9	.....	.....	.....	.....	.....	....	....	.....	.....	.....	.....	.....	.....	$.50	11-13.9
14-14.9	.....	$.65	$.65	$.65	$.65	....	.....	$.65	$.65	$.65	$.55	$.55	.....	.55	14-14.9
15-15.9	.....	.65	.65	.65	.65	....	.....	.65	.65	.65	.55	.55	.55	.55	15-15.9
16-16.9	.....	.65	.65	.65	.65	....	.....	.65	.65	.65	.55	.55	.55	.55	16-16.9
17-17.9	.....	.65	.65	.65	.65	....	.....	.65	.65	.65	.55	.55	.55	.55	17-17.9
18-18.9	.....	.65	.65	.65	.65	....	.....	.65	.65	.65	.55	.55	.55	.55	18-18.9
19-19.9	.....	.65	.65	.65	.65	....	$.65	.65	.65	.65	.55	.55	.55	.55	19-19.9
20-20.9	.....	.65	.65	.65	.65	....	.65	.65	.65	.65	.56	.55	.55	.55	20-20.9
21-21.9	.....	.65	.65	.65	.65	....	.66	.66	.65	.65	.57	.55	.57	.55	21-21.9
22-22.9	.....	.65	.65	.65	.66	....	.67	.67	.65	.65	.59	.55	.59	.56	22-22.9
23-23.9	.....	.67	.67	.67	.67	....	.68	.68	.65	.65	.61	.55	.60	.58	23-23.9
24-24.9	.....	.69	.69	.69	$.69	.68	$.65	.69	.69	.65	.66	.63	.55	.62	.61	24-24.9
25-25.9	.....	.71	.71	.71	.71	.70	.65	.70	.70	.65	.68	.65	.57	.64	.64	25-25.9
26-26.9	.....	.73	.73	.73	.73	....	.65	....	.72	....	.70	.67	....	.66	.66	26-26.9
27-27.9	.....	.75	.75	.75	.75	....	.68	....	.74	....	.72	....	....	.67	.68	27-27.9
28-28.9	.....	.77	....	....	.77	....	.71	....	....	....	.74	....	....	.69	.71	28-28.9
29-29.9	.....	.79	....	....	.79	....	.73	....	....	....	.76	....	....	.71	.74	29-29.9
30-30.9	.....	.81	....	....	.81	....	.75	....	....	....	.78	....	....	.72	.76	30-30.9
31-31.9	.....	....	....	....	.83	....	.78	....	....	....	....	....	....	....	....	31-31.9
32-32.9	.....	....	....	....	.85	....	.80	....	....	....	....	....	....	....	....	32-32.9
33-33.9	.....	....	....	....	.87	....	.83	....	....	....	....	....	....	....	....	33-33.9
34-34.9	.....	....	....	....	.89	....	.85	....	....	....	....	....	....	....	....	34-34.9

*Subject to a gathering charge of 5 cents per barrel.

under present conditions as to what may be safely taken without waste. Nor is there any evidence before us upon which we could form a conclusion of our own as to what amount of oil might safely, without violation of the statutes' prohibition against waste, be produced from plaintiffs' wells.

Plaintiffs Must Show Cause

We may not, in view of the attitude which the plaintiffs and the commission have taken in this cause in not pressing the issue between them, at this time make any decision on that issue or grant any relief as to the commission. In this situation, we are disposed to authorize a decree enjoining the defendants, the two Sterlings and Wolters, from enforcing against plaintiffs any of their so-called military orders already passed or to be passed, regulating or restricting the production from their wells, and from in any manner interfering with the lawful production of oil from plaintiffs' property, conditioned upon the plaintiffs before opening their wells to produce more than their neighbors are now content without complaint of oppression to produce, making a showing as to what amount of oil can be reasonably taken therefrom per day; or preferably, upon the condition that pending a further hearing of the controversy between the plaintiffs and the commission as to the right of the commission to limit their production, plaintiffs produce no more oil than that which, upon a specific and precise examination of their wells, and a finding under the statutes prohibiting waste, the commission finds the wells may produce without the waste prohibited by law.

A decree prepared in accordance with these views may be presented to the district judge for settlement within 15 days.

INTERPRET POINTS OF RESIDUE GAS CURVE

(Continued from Page 82)

7.95	25.50	17.25	—20.75
8.00	25.10	17.30	—21.00
8.05	24.80	17.35	—21.15
8.10	24.50	17.40	—21.30
8.15	24.25	17.45	—21.55
8.20	24.00	17.50	—21.80
8.25	23.65	17.55	—21.95
8.30	23.30	17.60	—22.10
8.35	22.95	17.65	—22.35
8.40	22.60	17.70	—22.60
8.45	22.30	17.75	—22.80
8.50	22.00	17.80	—23.00
8.55	21.70	17.85	—23.25
8.60	21.40	17.90	—23.50
8.65	21.10	17.95	—23.70
8.70	20.80	18.00	—23.90
8.75	20.55	18.05	—24.10
8.80	20.30	18.10	—24.30
8.85	20.05	18.15	—24.55
8.90	19.80	18.20	—24.80
8.95	19.50	18.25	25.00
9.00	19.20	18.30	—25.20
9.05	18.85	18.35	—25.45
9.10	18.50	18.40	—25.70
9.15	18.20	18.45	—25.90
9.20	17.90	18.50	—26.10
9.25	17.60	18.55	—26.30

TANK WAGON CHANGES

(Continued from Page 86)

company reduced kerosene tank wagon price at Newark, N. J., 2 cents per gallon.

Standard Oil Co. (Kentucky) effective February 8 advanced kerosene tank wagon price at Tampa, Fla., 2 cents to 14 cents per gallon. The company effective February 15 reduced kerosene tank wagon price 2 cents at Covington, Ky., to 10 cents.

Standard Oil Co. of Louisiana effective February 15 reduced gasoline tank wagon and service station prices throughout territory one-half cent per gallon except New Orleans, Alexandria, Lake Charles, Memphis and Bristol, Tenn. The company effective February 15 reduced kerosene tank wagon price 2 cents at Lafayette, La.

GEOLOGISTS CHANGE DISTRICTS

Indian Territory Illuminating Oil Co. announces the following changes in its divisional geologists: H. L. Miller, is now in charge of the Greater Seminole area; C. W. Roop, the Wichita, Kans., area; J. H. Darden, the Southwest Texas area, with headquarters at San Antonio; and T. C. Hoke has been transferred from San Antonio to Bartlesville, Okla.

DULL TRADING IN OKLAHOMA MARKET

(Continued from Page 12)

wall," said one company executive, "a refiner must keep pace with this trend toward high octane gasoline through improved manufacturing facilities or he will soon pass out of the picture." This executive points out that the refiner making the low octane gasoline pays the same price for his crude oil supply as does the refiner with adequate cracking facilities to make the high octane motor fuels, and for that reason he is not in a position to absorb the lower prices which he must take for his gasoline output.

Ethyl Gasoline

This situation will increase in importance March 1 when the new contract of the Ethyl Gasoline Corp. with its licensees becomes effective. The contract provides for an increase in the minimum octane requirement for Ethyl Gasoline from 74 to 78. The royalty per gallon is decreased from .5 cent to .425 cent. Taking into consideration the cost of the tetraethyl lead the minimum cost of Ethyl Gasoline to the refiner at his plant under the new contract will be .74 cent per gallon and the maximum 1.475 cents per gallon. To use the minimum amount of tetraethyl gasoline the refiner will have to have a base gasoline with an octane number around 68 and when the maximum amount of tetraethyl lead permitted under the contract is used the octane number of the base gasoline will have to be at least 58. Gasolines vary in their susceptibility to tetraethyl lead but the above estimates will cover average conditions.

This means that after March 1 gasoline under 57 octane cannot be brought to meet Ethyl Gasoline requirements if the maximum amount of tetraethyl lead is used. Refiners manufacturing Ethyl Gasoline—which includes all the major operators with one exception—generally try to have a sufficiently high rating in their base gasoline so that they can use the minimum quantity of the Ethyl fluid. To do this under the new contract will require an exceptional grade of cracked gasoline. Thus more stress is placed on highest octane gasoline in a refinery's output. Unless a refiner operating with Mid-Continent crudes has adequate cracking facilities the new Ethyl contract simply means that he must conserve his anti-knock material and until such time as manufacturing facilities can be expanded it assures more low octane material available on the spot market.

Gasoline and Naphtha

The low octane U. S. Motor was being offered to the trade the first of the week at a low of 2¾ cents. Resale material was sold at 2⅝ cents with some offers under this price in areas competitive to Oklahoma. The lower prices did not attract buying. The 57-65 grade was more strongly held at a price range of 3¼ to 3½ cents.

The low on 60-62, 400 endpoint was 3 cents; 64-66, 375, 3½ cents, and 350 and 360 endpoints, 3¾ cents. Several refiners have 375-endpoint material which they would like to move. The attention paid to octane rather than gravity and endpoint has taken away the former interest in this grade and there is practically no domestic demand. The export situation is indicated in the fact that a cargo order for 375 last week was placed at 4⅛ cents basis the Gulf Coast. On a basis of Oklahoma this would mean approximately 2¼ cents.

Natural Gasolines

Natural gasolines were steady the first of the week. More buying could be absorbed by the sellers but at the same time no distress material is being thrown on the market. Some of the buyers and sellers continue to store excess material in expectation of higher prices. The 26-70 grade was moving at a price range of 1⅜ to 1½ cents. The 18-55 was quoted at 1⅞ to 2⅛ cents and 30-70 at 1¼ cents. Some high vapor pressure and low recovery material was reported sold in Texas as low as 1⅛ cents.

Fuels

No changes were reported in fuels from the low gravity residual oils to the high gravity furnace oils. The latter are not as strong as they were earlier in the month but prices are steady in Oklahoma. The bulk of the material is moving on contracts. Refiners with spot material to sell are getting from 22½ to 30 cents per barrel for gravities under 20, the spread in prices being largely dependent on the amount of freight rate that has to be absorbed by the seller. The demand for the high gravity grades is slow. One sale of 28-30 zero at 50 cents per barrel was reported. This appeared to be the top of the market for interstate shipments.

U.G.I. gas oils are available from several sources at a price range of 1 to 1⅛ cents. High cold test material has been sold under the 1-cent price.

Kerosene

The price range of 2⅝ cents and 2¾ cents for 41-43 kerosene is being maintained in Oklahoma for material which meets all specifications. Some kerosene of the same gravity which does not meet all the specifications is selling at a low of 2½ cents.

W. R. BOYD TAKES REST

NEW YORK, Feb. 22.—When members of the board of directors of the American Petroleum Institute met Thursday, February 18, in regular session, William R. Boyd, Jr., executive vice president, was absent. Tired after an arduous season of work and a siege of winter colds, Mr. Boyd had gone away for a rest. It was the first session of the board from which he had been absent in 11 years. President Amos L. Beaty announced that Mr. Boyd had yielded to the importunings of his staff to go away for a brief while. He is expected to return within a few days.

PRODUCTION PRACTICE TOPICAL COMMITTEE

Harvey Hardison, of the California Co., Midland, Tex., has been appointed national chairman for 1932 of the topical committee on production practice, which is an adjunct of the central committee on drilling and production practice of the American Petroleum Institute. Personnel follows:

California district—E. W. Master, Shell Oil Co. (chairman); H. A. Brett, Union Oil Co. (secretary); L. L. Brundred, Spang, Chalfant & Co.; A. S. Hayes, General Petroleum Corp.; H. N. Marsh, General Petroleum Corp.; E. W. Spurlock, Standard Oil Co.; J. H. Wallace, Jr., Union Oil Co.; and D. K. Weaver, The Texas Company.

Eastern district—Paul D. Torrey: John C. Askam, Ohio Oil Co.; Joseph A. Holmes, Jr., Pan American Petroleum & Transport Co.; and C. E. Reed, Hope Natural Gas Co.

Mid-Continent district—L. A. Ogden, Empire Companies (chairman); Watson Bettis, Gypsy Oil Co.; C. M. Copeland, Comar Oil Co.; K. A. Covell, Indian Territory Illuminating Oil Co.; H. C. Fitzpatrick, Prairie Oil & Gas Co.; E. H. Griswold, Continental Oil Co.; F. B. Hall, Tidal Oil Co.; L. B. Holland, Phillips Petroleum Co.; H. E. Shaffer, Pure Oil Co.; and D. L. Trax, Gypsy Oil Co.

Rocky Mountain district—J. J. Zorichak, Midwest Refining Co. (chairman); T. H. Andrews, Midwest Refining Co.; L. C. Binning, Prairie Oil & Gas Co.; and Joe Dyer, Continental Oil Co.

Southwestern district—H. M. Stagga, Atlantic Oil Producing Co. (chairman); A. L. Faber, Arkansas Light & Power Co.; George B. Corless, Humble Oil & Refining Co.; R. B. Kelly, Pure Oil Co.; L. L. Lookabaugh, Shell Petroleum Corp.; W. L. Olmstead, Panhandle Refining Co.; T. W. Rhoads, Gulf Production Co.; John A. Ritter, Sun Oil Co.; W. C. Shutts, Humble Oil & Refining Co.; F. M. Stauffer, Wichita Falls; and W. V. Vietti, The Texas Company.

OKLAHOMA GEOLOGICAL SOCIETY

The files and records of the Oklahoma Geological Society, Norman, have finally been placed in charge of Charles E. Decker, professor of paleontology at the University of Oklahoma. The services of the Oklahoma Geological Survey were discontinued some time ago because of lack of funds. This new arrangement will permit those who desire to secure copies of publications of the survey from Professor Decker by addressing him at Norman, Okla.

ROESER TO SPEAK

Charles F. Roeser, Fort Worth, Tex., will be the principal speaker at the banquet which will close the annual convention of the Southern Oklahoma Oil & Gas Association to be held in Ardmore, Okla., February 25. Mr. Roeser, vice president of the American Petroleum Institute and chairman of the division on production of the A.P.I., will discuss oil problems that confront the independent producer. Harold B. Fell of Ardmore is president of the association.

ELECT C. P. POLAND

SPRINGFIELD, Ill., Feb. 20.—C. P. Poland of St. Louis and George Prescott of Dixon were re-elected president and vice president, respectively, here today at the annual meeting of the Illinois Petroleum Marketers Association. Directors named were M. C. Hill, Peoria; Lon Williams, Carlinsville; H. G. Richardson, Quincy; E. P. Smith, Edwardsville, and H. Leaverenz, Dasville.

GULF COAST WATER SHIPMENTS SHOW INCREASE IN JANUARY

By Nell Williams

HOUSTON, Tex., Feb. 22.—Water shipments of oil from Gulf Coast ports during January totaled 20,125,935.33 bbls., an increase of 2,633,792.71 bbls. over shipments of December. The shipments were greater than for any single month since March, 1930, when 20,311,328.08 bbls. were lifted. The largest gain during January was in coastwise movements of crude which amounted to 9,123,143.98. A decrease was shown only in export liftings of refined products. Shipments by ports were:

Company and terminal—	Crude: Coastwise (bbls.)	Crude: Export (bbls.)	Refined: Coastwise (bbls.)	Refined: Export (bbls.)	Total (bbls.)
Atlantic Oil Prod. Co., Atreco	1,278,048.07	.....	.....	.....	1,278,048.07
Gulf Ref. Co., Port Arthur	293,315.65	.....	2,305,169.50	107,441.00	2,605,926.15
Humble O. & R. Co., Baytown	227,321.00	.....	1,099,089.98	1,289,948.46	2,616,359.44
Humble O. & R. Co., Harbor Island	2,412,069.00	.....	.....	.....	2,412,069.00
Humble O. & R. Co., Ingleside	67,242.00	.....	.....	.....	67,242.00
Humble O. & R. Co., Neches	75,119.00	.....	.....	.....	75,119.00
Humble O. & R. Co., Texas City	420,368.00	.....	.....	.....	420,368.00
Magnolia Pet. Co., Beaumont	*614,966.35	.....	*1,840,200.76	.....	*2,455,167.11
Pure Oil Co., Smiths Bluff	436,271.25	.....	596,029.53	33,751.12	1,066,051.90
Standard Oil Co. (La.) Baton Rouge	496,893.00	.....	732,543.00	939,557.00	2,158,993.00
Sun Oil Co., Sabine Pass	1,284,427.66	.....	.....	.....	1,284,427.66
The Texas Co., Port Arthur	1,516,603.00	124,014.00	1,659,401.00	385,646.00	3,685,664.00
Total January	9,123,143.98	124,014.00	8,122,433.77	2,756,343.58	20,125,935.33
Total December	6,764,416.35	20,493.00	7,633,822.79	3,073,410.48	17,492,142.62
Difference	2,358,727.63	103,521.00	488,610.98	317,066.90	2,633,792.71

*Includes coastwise and export shipments.

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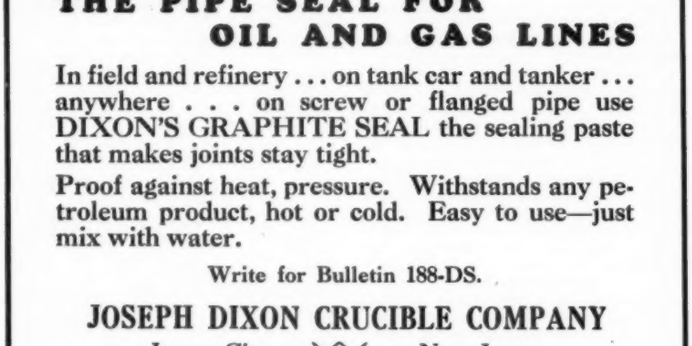

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2-25-32

Large Increase in Rumanian Shipments to United Kingdom

NEW YORK, Feb. 22.—Rumanian shipments of refined petroleum products into the United Kingdom during 1931, according to government statistics, established a new high record at 198,646,000 imperial gallons, an increase of 70,183,000 gallons, or approximately 55 per cent over the 1930 shipments of 128,463,000 gallons.

The increase in gallonage last year was close to the total of 71,758,000 gallons of Rumanian refined products shipped into the United Kingdom during the entire year 1929. In that year Rumania supplied but 4.2 per cent of the total consumption in the United Kingdom, its proportion increasing to 6.7 per cent in 1930 and 10.7 per cent last year.

Rumanian shipments into the United Kingdom last year, with comparisons for 1930, follow:

	Imperial gallons	
	1931	1930
Gasoline	108,437,000	52,245,000
Kerosene	41,908,000	23,020,000
Gas oil	22,910,000	11,777,000
Lub oil	1,568,000	3,173,000
Fuel oil	13,625,000	27,581,000
Other oils	10,198,000	10,667,000

Shipments of Rumanian gasoline to the United Kingdom last year more than doubled the 1930 total, while the aggregate gallonage for that year, 52,245,000 gallons, in turn doubled the 25,132,000 gallons shipped during 1929.

The heavier shipments of Rumanian fuel oil to the United Kingdom last year were responsible in large measure for the break in bunker oil prices at United States East Coast ports last year, which carried the market down to 60 cents per barrel, the lowest price in the recorded history of the industry. Rumanian competition for bunkering business of the transatlantic liners was particularly marked during 1931 and continues so at present.

Late Fields

(Continued from Page 24)

gauged 1,417 bbls. of oil a day from the Viola lime at 3,387-99 feet.

Derby Oil Co.'s No. 1 Stratman, in Section 12-16-10w, Ellsworth County, has been making 200 bbls. a day from the Silicious lime at a total depth of 3,283 feet.

The Derby Oil Co. has been granted permission by the Public Service Commission, to open and produce its No. 1 Stoltenberg, in Section 22-17-10w, a wildcat in Ellsworth County, 15 per cent of its potential. When the well was tested recently it made an average of 1,515 bbls. a day on a five-day test. The commission's decision to permit the opening of the well immediately was announced at the hearing held in Wichita, Friday.

SOVIET OIL SALES IN ENGLAND INCREASED

Although England's petroleum imports last year recorded a drop of 4 per cent from 1930 totals, Soviet shipments of refined products into the United Kingdom were off but slightly, and the percentage of British trade held by Russian oil was higher than in 1930.

According to data compiled by London "Petroleum Times," a total of 262,536,000 gallons of Russian oil products were shipped into the United Kingdom during 1931, accounting for 14.1 per cent of last year's trade in refined petroleum. This compared with 264,461,000 gallons, or 13.6 per cent of the total, in 1930.

Detailed data on 1931 imports, with comparison for the previous year, follow:

	Imperial gallons	
	1931	1930
Gasoline	126,643,000	116,385,000
Kerosene	72,917,000	74,980,000
Gas oil	7,248,000	15,920,000
Lub oil	15,671,000	13,337,000
Fuel oil	39,471,000	43,389,000
Other oils	586,000	.....

The effect of Russian competition upon sales of American gasoline in the British market is reflected by the increase of more than 10,000,000 gallons in sales of the Russian product in the United Kingdom last year. Last year's shipments of gasoline from Russia to the United Kingdom showed a gain of more than 48,500,000 gallons over similar shipments in 1929.

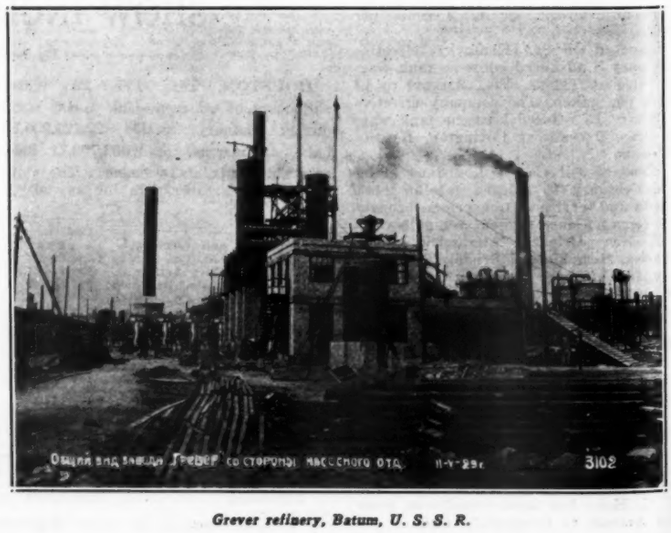
CREDIT BUREAU IS PLANNED

CHICAGO, Feb. 22.—Plans of the Burning Oil Distributors Association for the coming year call for an efficient credit bureau and an advertising campaign, according to Floyd Moore, Seneca Petroleum Co., the newly elected president. The association is made up of 32 oil distributing companies in the Chicago metropolitan area. Other officers elected besides Mr. Moore are Frank Spencer, Spencer Petroleum, treasurer; A. D. King, secretary; Frank Schindler, auditor, and J. M. Carson, administrator. The new directorate chosen includes Mr. Moore, C. O. Frisbie, Commerce Petroleum Co.; C. S. Rosenthal, Apex Motor Fuel; A. H. Petersen, North Shore Petroleum; R. F. Dopel, Braun Brothers; E. W. Miles, Murphy Miles Oil Co.; E. L. Hughes, Hughes Oil Co.; C. R. Jonswold, Lynch-Clarisey Co.

MICHIGAN LINE PERMIT

MOUNT PLEASANT, Mich., Feb. 20. A permit has been issued to the Great Western Construction Co. to lay a 4 or 6-inch oil pipe line from the East Field to the Muskegon refinery.

George Clark, former county surveyor in Muskegon, and now a drainage contractor, is already surveying for the line.



Grever refinery, Batum, U. S. S. R.

SOVIET REPLIES TO CRITICS; DECLARES OUTLOOK FAVORABLE

NEW YORK, Feb. 22.—Although the development of the Russian oil industry in some respects has not kept pace with scheduled operations for the past year, expansion of the industry continues at a rapid rate and the outlook is favorable for further increases in operation, according to an official statement recently published in "Izvestya."

The statement points out that during the first nine months of 1931 production of petroleum in Russia showed an increase of 25 per cent over that for the comparable months of 1930, when it totaled 13,150,000 tons.

Exports have likewise increased substantially in recent years, says the Soviet statement, giving the following figures on exports from 1927 on, with comparison with 1921 and the prewar year of 1913:

	Tons
1913	947,700
1921	31,300
1927	2,181,000
1928	3,008,000
1929	3,815,200
1930	4,803,000
1930 (10 months)	3,984,700
1931 (10 months)	4,332,100

Position in Europe

The Soviet, the statement points out, has attained an important position in European markets, where the largest proportions of Russian oil shipments go. The position of leading suppliers to the European market for the year 1930 is compared as follows:

	Tons	Pct. of total
Imported from America (U. S., Venezuela, Colombia, Trinidad, etc.)	10,873,000	45.95
Imported from Asia (Persia, India, Dutch Indies, etc.	5,568,000	23.53
Imported from U.S.S.R.	3,269,000	13.82
Imported from Rumania	2,670,000	11.29
Imported from Poland	106,000	0.45

A comparison of Rumanian and Soviet oil exports to the principal European and Mediterranean markets for 1930 is given as follows:

	Imports (tons)	Percentage participation of Rumania	U.S.S.R.	Others
England	8,972,900	5.3	10 7	84.0
Czecho-Slovakia	403,000	30 8	28 1	41.1
Belgium	542,700	8.6	10 7	80.7
France	3,549,100	6 4	10.6	83.0
Spain	672,100	7.3	45.4	47 3
Italy	1,435,800	24.7	31 6	43.7
Germany	3,337,300	6 5	11.6	81.9
Turkey	115,500	21 4	70.9	7.7
Egypt	559,600	49.2	22 1	28.7
Greece	160,700	54.4	39.8	5.8

Further increases in Russian participation in European markets developed during 1931, the statement says, with the Soviet accounting for 18.6 per cent of all German gasoline imports and 29.5 per cent of lubricating oil imports. Increases were also recorded in the French market by the Soviet last year.

Home Consumption

Offsetting reports that Russia's home markets were being "starved" to build up export tonnage, the statement gives the following comparison of domestic consumption in Russia of gasoline and kerosene as follows:

	Tons Gasoline	Kerosene
Avg. prewar per year	35,900	520,500
1925	45,000	575,700
1927	83,900	1,059,700
1930	357,200	2,190,400

"It will be seen from the above figures and table," says the statement, "that from 1913 to 1931 the consumption of oil products in Soviet Russia has almost doubled, while motor spirit consumption has risen tenfold and that of kerosene—the product in demand by the masses—has more than trebled in spite of the great strides made in electrification all over the country.

"Thus domestic consumption has grown apace with oil exports and the statistics we have given are sufficient to disprove the assumption of the Royal Dutch that the extension of the U.S.S.R. oil export trade is made at the expense of limiting home consumption. The industrialization of country, collective rural economy and other factors will cause domestic demand to grow still further, while, at the same time, production and refining will increase at a rate not hitherto seen. At the end of the second five-year plan Soviet Russia must occupy the first place in the world's oil production.

"Equal success has been obtained in improving the quality of the oil products. Whereas in 1913 the proportion of motor spirit obtained from crude was 2.7 per cent, it rose to 9.7 per cent in 1927, to 11 per cent in 1929, and to 11.9 per cent in 1930. This was due to the reconstruction and improvement of the refining industry and the wide application of the cracking process. Refinery throughput during these years rose as follows:

	Tons
1913	5,702,000
1927	7,175,000
1928	8,882,000
1929	11,653,000
1930	16,181,000
1931 (10 months)	13,124,000

"It will thus be seen that in the first 10 months of last year the amount refined was three times as great as that during the whole of 1913. So production and refining have grown greater than domestic consumption and have meant an increase in the oil export trade."

POTASH FIRMS SEEK OIL

NEW YORK, Feb. 22.—Burbach, Salzdefurth and Wintershall, leading German potash producers, are considering plans for amalgamating their petroleum development activities, with the possibility of organization of a separate operating company for this purpose, according to reports from Berlin.

Considerable production has been obtained by the Burbach company from wells drilled from the bottom of its Volkenroda potash mine, and favorable showings have been developed by geologists in other potash mining districts.

Despite the care taken in drilling for oil from the bottom of the potash shafts, a serious explosion occurred recently in the Volkenroda mine, with some loss of life. The oil is under heavy pressure, and wells are pinched in as fast as they are completed.

SAKHALIN OUTPUT

NEW YORK, Feb. 22.—Results of production for the first 11 months of 1931 indicate that the Sakhalinneft (Sakhalin Oil Trust) fulfilled its program only 50 per cent, according to Moscow advices. This year the trust is scheduled to produce 500,000 tons of crude petroleum, and in 1933 1,200,000 tons.

A geological expedition at work in the central part of Sakhalin Island has discovered new deposits 30 kilometers from the shores of the Sea of Okhotsk. Oil had hitherto been found only along the eastern and western coast of the island, and it was believed that the central section contained none.

The new deposits are similar to those in the Okha fields. During 1932 the Oil Institute expects to send a larger geological group to make a more thorough study of them.

TWO NEW RUSSIAN GUSHERS

NEW YORK, Feb. 22.—A new oil gusher was struck by Soviet field workers in the Berekeisk district of southern Daghestan at a depth of 395 meters. The gusher flowed 40 tons per hour initial. Oil was also struck at a depth of 105 feet along the northwestern shore of Lake Baikal, in the Mongol-Buriat Republic of the East Siberian region. It is thought its source is under the lake bed, and drilling operations have been started through the ice.

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FACTORS IN RUSSIAN EXPORTS ARE ANALYZED BY ENGINEERS

By F. T. Kapcevitch
Engineer E. T. Lg.

To make the study of the Soviet oil export easier the essential difference between the estimates on the export program laid in the foundation of the Five Year Plan, on one hand, and the real situation now existing, on the other hand, must be pointed out. The tempo of Soviet oil export adopted by the plan is recognized by the responsible executives of Soviet petroleum institutions as being far above the margin of increasing foreign market possibilities. In view of this fact the reinforcement of Soviet competition with "the world oil interests" in the main foreign markets was foreseen by the Soviet economists.

A considerable extension of the Soviet petroleum trading organization abroad was decided upon with the purpose of facilitating the struggle with this growing competition in the countries where Soviet oil products are not strong enough to control the entire market. Moreover, the problem of an important ship-building program was discussed; new Soviet tankers would facilitate the export of petroleum products and their introduction to new foreign markets. At present the tonnage of the Soviet tankers in the Black Sea does not exceed 150,000 tons (including the newly built ships and those in construction) and it can supply only about 15 per cent of the tonnage required for oil products export.

Thus it appears that the oil export program, as well as its production, necessitated considerable new investments and, what is most essential, heavy expenditure in foreign currency. But due to the financial crisis, the conditions of the oil industry and those of home consumption, the Soviet oil trade organizations are forced to discontinue the largest part of their new investments and to abandon their great plans for a new expansion in the foreign markets. The home market, with the industrialization and the mechanization of agriculture, requires at present a much greater attention than was the case in the time of the predomination of the private enterprise system, the interests of which were always less considered by the Soviet government.

New Plants for Home Supply

Regarding further oil export development, the Soyouznepht decision to discontinue, from the next year, the construction of any refineries (lubricating plants) in the oil areas and to concentrate the new construction program in the center of the country, is of extreme importance. The plants to be constructed in central Russia are to assure the home oil supply. The operating power of the lubricating and cracking plants in the oil areas and export bases (Batoum, Touapse) is limited to the amount of 24,000,000-25,000,000 tons per annum. In this figure are also included the units in construction. Consequently, all the estimates concerning the future of petroleum exports are to be made in consideration of this decision. The problem of oil transportation, which became recently acute, is closely connected with the preceding one.

Transportation means—railroads as well as water system (Caspian Sea-Volga River)—does not correspond, so far as petroleum products freights are concerned, to the requirements formulated by the program. Here the difficulties are so great and the impossibility in the immediate future of securing any fundamental amelioration is so obvious that the responsible boards of the oil trusts were lately obliged to point out to the government the critical situation and to decline all further responsibility for the fulfillment of the program datas. Seeing the necessity to deliver from the production centers, not only oil products, but also the crude for the inland refineries, the transport question became an unconquerable impediment for the petroleum industries' further normal development, and the fate of the plants situated in the center of the country, so far as the immediate future is concerned, at least, seems to be fixed; their operation cannot be carried on owing to the impossibility of securing a sufficient supply of the crude oil. Although the increase of home consumption is developing more slowly than was expected in the program, nevertheless, seeing the insufficient production, the influence of this factor became noticeable this year. During the first 10 months of 1931 the export of Soviet petroleum products increased but very slightly in comparison with the same period of 1930 (by 8.7 per cent only), attaining 4,332,000 tons, against 3,984,000 tons in the 1930 corresponding period.

Gasoline Exports

The gasoline export indicates a considerable increase.

EXPORT (In thousand tons)

Products—	1931 First 10 months	1930 First 10 months
Gasoline	1,467.5	1,213.8
Kerosene	560.18	650.7
Lubricating oil	185.3	170.6
Solar oil	35.5	59.5
Gas oil	324.3	347.3
Residues (fuel oil)	1,509.6	1,322.3
Dark lubricating oil	3.78	10.26
Crude oil	239.8	203.6
Asphalts	5.9	0.1
Different	0.14	5.84
Total	4,332	3,984

To be able to measure the export future possibilities of Soviet petroleum products the examination of the home market requirements must be made at first. The actual consumption for the year 1930 and the first half of 1931, as well as the plan figures for 1932 and 1933 are given in the following table:

SOVIET HOME MARKET CONSUMPTION
(In thousands tons)

	1930 (actual)	1931 (act. first half)	Plan figures 1932	Plan figures 1933
Gasoline and naphtha	354	219	728	4,970
Kerosene	2,173.5	1,159	*3,730	†8,350
Gas oil	922.3	475	....	....
Lubricating oil	457.2	250.5	....	875
Dark lubricating oil	271	111.6	....	....
Fuel oil	6,213	2,896	....	....
	10,391	5,111.1	....	....

*Including 1,820,000 tons of tractor fuel.
†Including 5,250,000 tons of tractor fuel.

During 1930 about 1,500,000 tons of gasoline were exported. Gasoline is and will remain the chief product, the largest supplies of which are prepared for export. It would be interesting to note that the former program of gasoline export, established by the Soyouznepht, foresees the approximate figure of 5,000,000 tons for 1933. In reality, however, one has to admit that during the next two years exports of gasoline will not exceed an average of 2,502,810 tons per annum. On the contrary, the possibilities of export development of other petroleum products are less favorable. The use of kerosene (as tractor fuel) on the home market would be growing in such a proportion that export of this product might be considerably reduced.

Tractor Increase Factor

While appreciating the possibilities of the ultimate Soviet petroleum products export the following data were taken into consideration: (1) The possible increase of the home consumption; (2) the refining capacity of 25,000,000 tons per annum, and (3) the possible participation of the cracking process, by the end of

1933, with a capacity not exceeding 1,000,000 tons of gasoline. The home market oil consumption is in direct dependence upon the increase in tractors. Though these did not completely attain the figures fixed by the plan, the number of tractors was greatly increased during the past year. In 1931 the Soviet plants issued about 40,000 tractors. The fuel consumption by unit and per annum (10-20 horsepower) attains approximately 8-8.5 tons.

TRACTOR UNITS OF THE U.S.S.R.
(In thousands)

	1929-30	1930-31	1931-32	1932-33
Existing units	73.3	106	...	...
Program figures	...	183	400	915

In view of the existing tendency "to develop exports at all costs—to get as much foreign currency as possible," some modifications can be expected. In any case one might estimate the kerosene export probabilities as limited to 1,000,000 tons per annum, which would give just a slight difference from the figures of 1930 (780,000 tons). As to lubricating oil and the fuel oil there are no reasons for their export to be extraordinarily increased. The lubricating section, particularly, was one of the most backward branches of the Soviet oil industry, and the improvements expected in this line—owing to the fact that the construction of new plants and general reorganization of the entire industry are being delayed because of the insufficiency of financing—are not accomplished. The increase in exports of these products could be obtained through some extraordinary measures only, though even in this last case export possibilities for lubricating oil would be limited by the general amount of some 300,000 to 400,000 tons per annum, while those of fuel oil would not exceed 3,500,000 or 4,000,000 tons, deduction being made of the residues used by the cracking plants and high pourpoint residues unusable for the export purposes.

Among the new tendencies existing the eventual increase of crude oil export can be indicated. This was always considered as scarcely profitable and was carried out in rather a small proportion (194,000.000 tons in 1930). In view of the recent financial difficulties and the possible disproportion between the oil yields and the number of refineries existing, the idea of developing this little promising (even from the Soviet point of view) line of business appeared. However, the oil refining situation in France gives apparently some possible hope for the eventual successful application of these schemes in foreign markets. In any case the negotiations between the interested parties are already on.

In conclusion, the influence exercised on exports by the replacement of the larger part of the competent personnel of the Soviet foreign trading organization by new and less capable persons ought to be pointed out. In several of their organizations "the cleanout" bore the character of a general disbandment. The reorganization of the oil trade in foreign countries was followed by the reorganization of the central administration of the petroleum industries in Moscow.

Pessimistic in Outlook

The unfavorable influence exercised by these modifications is still more felt in business, due to the fact that these changes coincided with an especially difficult moment for the petroleum industry in the country and oil exports to foreign markets. At present one of the most important questions for a successful export policy is qualificative competition. The advantages retained at first by Soviet petroleum products gradually passed over to their competitors' goods. To overcome all the difficulties of the qualitative competition was a very hard problem even with the old Soviet foreign trading organization and it seems almost beyond powers of its new personnel. The prospects for petroleum products exports in the next few years can be considered as being rather pessimistic. Neither the situation of the Soviet oil industry, nor the actual conditions existing in foreign markets, contribute to the extension of exports, as in the past, exception being made for gasoline. A stabilization and even a partial falling down of the absolute export figures must be expected. As to its qualitative side and financial results, this last began to drop in 1931. For the first six months, with the total exports of 2,445 tons, 61,200 000 roubles were obtained, against 79,770,000 roubles secured during the first six months of 1930, with the total export of 2,399 tons.

INDIANA SUBSURFACE STRATA

The "Subsurface Strata of Indiana," by Dr. W. N. Logan, is now ready for distribution. It contains all the records in the "Geology of the Deep Wells of Indiana" with the addition of those obtained up to June 1, 1931. Revision has been made and extra material added on the general occurrence of oil with relation to structural conditions. Structural maps drawn on the Devonian, Trenton and St. Peter formations are also shown.

RUMANIA'S OUTPUT

NEW YORK, Feb. 22.—Production of crude petroleum in Rumanian in December, according to "Moniteur du Petrole Rumain," approximated 560,000 tons, unchanged from the previous month's output but 90,000 tons under December, 1930, production totals.

The leading five producers were as follows: Astra Romana, 119,926 tons; Steaua Romana. 82,737 tons; Concordia, 72,864 tons; Romano-Americana, 47,838 tons; Phoenix Oil, 45,706 tons.

Total production for the year 1931, according to the same authority, amounted to 6,600,000 tons, an increase of approximately 14 per cent over the 5,800,000 tons produced in 1930.

STRAITS SETTLEMENTS TESTS

NEW YORK, Feb. 22.—Royal Dutch-Shell is conducting test drilling operations in the Klias Peninsula of the Straits Settlements, operating through Singapore Oil Syndicate, Ltd., a subsidiary. Geological reports have indicated that the possibility of finding oil in commercial quantities in this area is favorable.

EXAMPLE IN USE OF GRAPH

(Continued from Page 50)

Since the condensate is but one-fourth of the total overhead

$$167.4 \times 4 = 669 \text{ B.t.u./lb.}$$

For every pound of 110 gr. overhead produced, 669 B.t.u. must be removed by the cooling water from the primary condenser.

Heat Balance—Secondary Condenser

Operating pressure of secondary condenser is approximately 38 pounds. Referring to chart, 110 gr. overhead will condense at 75° F. and the latent heat of condensation is 155 B.t.u./lb.

Superheat (165° — 75°) .435	=	39.2 B.t.u./lb. overhead
Latent heat	=	155.0 B.t.u./lb. overhead
Liquid heat (75 — 65) .6	=	6.0 B.t.u./lb. overhead
Total heat		200.2 B.t.u./lb. overhead

Therefore, 200.2 B.t.u./lb. overhead must be removed from the secondary condenser by the cooling water.

THERMAL PROPERTIES OF OIL FRACTIONS

(Continued from Page 50)

Critical temperatures are located for each compound and a curve is drawn through these points. From the graphic representation of equation 3 the temperatures are found for every pressure at each compound and the lines of constant pressure are plotted from .001 pound absolute to the pressure corresponding to the critical temperature.

These pressure lines were slight curves as many be seen by graph. Pressure lines are extended on from $C_{20}H_{42}$ to the end of the chart, and compounds above $C_{20}H_{42}$ were plotted by locating points of pressure and temperature where equilibrium existed for that compound. After the chart had been constructed in this manner isomeric compounds were added as well as unsaturates, naphthenes and aromatics.

Data for the normal paraffin hydrocarbons was obtained by a survey of the literature while the data for unsaturates, naphthenes and aromatics was taken from Rechenberg.[4] Petroleum distillations shown are averages. The fractions plotted are those having average boiling points of 100°, 200°, 300°, 400° and 500° F. at one atmosphere. The Anglo Persian Oil Co., Ltd., suggests

$$\log_{10} p = 6.76 - 3.88 \frac{t}{T} \qquad (4)$$

where p is pressure in mm. Hg.

t is ° C. absolute boiling point at 760 mm.

T is ° C. absolute boiling point at p mm.

as a formula for vapor pressure of "gasoline and motor spirits." Plotted, this equation gives a straight line with a rate of increase of pressure with temperature less than in case of normal paraffin hydrocarbons.

According to Meyer,[5] "sharply fractionated petroleum cuts of narrow boiling range are found to correspond closely to the pure hydrocarbon series." Brown[6] concluded that the vapor pressure curve of a hydrocarbon mixture was of a different type than that for pure compounds. It is very hard to predict theoretically vapor pressure curves for mixtures.

The other set of curves representing mean boiling point fractions at one atmosphere are averages of several oils which include equation 4, and many samples of Mid-Continent crude. This set of curves bears out Meyer's statement that oil, a mixture of hydrocarbons, being sharply fractionated agrees closely with paraffin series.

Latent Heat

Latent heats of vaporization for normal compounds are plotted on the auxiliary charts as a function of temperature. The compounds and latent heat lines are straight and at right angles. Temperature lines were plotted by used reliable data and Hildebrand's function. It was not necessary to use Hildebrand's method except above $C_{15}H_{32}$, however.

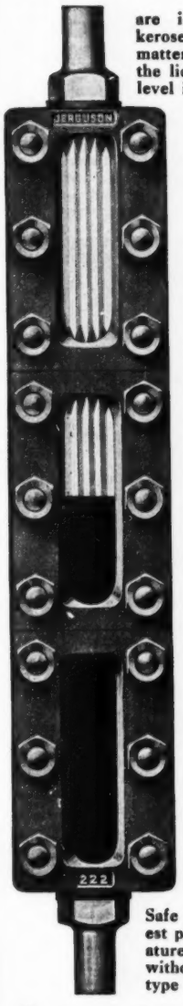
[4]Rechenberg, "Einfacke und Fraktionerte Distillation in Theorie und Praxis."

[5]Meyer, Vapor Pressure of Motor Spirits, Institute of Petroleum Technologists.

[6]Brown, Proceedings Seventh Annual Convention of National Gasoline Association of America, 1928.

JERGUSON

REFLEX GAGES



are ideal for gasoline, kerosene, steam, oil. No matter what the color of the liquid, they show the level in BLACK.

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The *Liquid* shows BLACK

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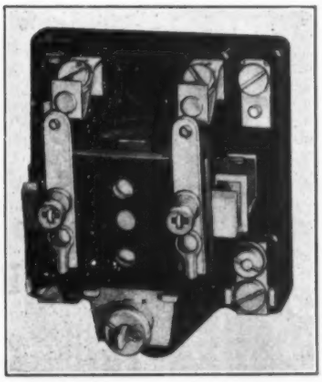
Oil Industry Equipment and Supplies

MAGNETIC CONTACTOR OF SMALL AMPERE CAPACITY

To meet an increasing demand for a dependable magnetic contactor of small ampere capacity, the Industrial Controller Division of the Square D Co., 710 South Third Street, Milwaukee, offers two new sizes of Class 8511, designated



Types H and K, rating from 3 to 15 amperes for noninductive load or the fractional horsepower ratings for 110-volt single phase motors.

Desirable structural features of larger contactors are embodied in the design: laminated magnet frames, floating armatures to insure quiet operation, silver-to-silver contacts, porcelain bases, approved temperature and insulation standards, voltages up to 220 volts for Type H and 440 volts for Type K.

These contactors are built in a variety of combinations, single and double pole, single and double throw, circuit opening and closing, two or three wire control, and three wire thermostat control.

Application includes temperature regulators, oil burners, stokers, signal and lighting systems, small motors, etc.

OXWELD WELDING HEADS HAVE DETACHABLE TIPS

A series of welding heads with detachable tips has been introduced by the Linde Air Products Co., 30 East Forty-second Street, New York, for use with the Oxweld type W-17 welding blowpipe. These will supplement the one-piece style heads for this blowpipe, so that the user will have a choice of two types of welding heads.

The new detachable tip heads were developed particularly for pipe line welding and for production operations. The new tip produces the same type of flame as that produced by the one-piece welding head for the type W-17 blowpipe. Sizes Nos. 6 to 13, inclusive, are available in the new welding heads.

One of the practical features of the new design is the connection between the tip and the stem provided by the male thread on the tip which screws into the stem. Removal or replacement of the welding tip is greatly facilitated.

APPROVED BY UNDERWRITERS

Explosion-proof A. C. automatic starters manufactured by the industrial controller division of the Square D Co., Milwaukee, Wis., have been approved by the Underwriters' Laboratory for use in Class 1, Group D, hazardous locations. Applicants for the starters are gasoline refineries and filling stations, paint, varnish, lacquer plants, etc. The starters, known as Class 8,528, are of the oil-immersed type and control across-the-line single and polyphase motors.

AUTOMATIC PACKAGING MACHINES INTRODUCED

The Export Petroleum Co. of California, Ltd., for years has owned and operated a large can and drum filling plant in Los Angeles. As a result of highly competitive conditions it was necessary to effect every possible economy. This led to the use of several special machines designed, developed and patented by Glenn A. Smith of the company, as the result of many years' experience in the operation of export packing plants.

Refiners in several parts of the world who learned of these machines have purchased them. It has been decided by the company to offer the machines to other refining companies which may desire more economically and efficiently to pack their products in tins and cases or in drums and barrels.

The machines are said to reduce labor cost, losses due to evaporation and spillage, solder consumption, leakage in transit and storage, fire hazard, insurance premium, fire and leakage. They include an automatic liquid measuring machine and traveling solder table, six-unit rotary; automatic cap-soldering machine, automatic liquid measuring machine, six-unit straight line; automatic 5-gallon can-tester and packer and a compressed-air sealing machine.

NEW BALDWIN CHAIN FOR SHALLOW WELLS OFFERED

An oil-field chain of the offset side bar type, embodying the precision and heat-treated qualities of the Baldwin deep well chains, but of lighter construction and designed for shallow drilling and ordinary oil field needs, is the new Baldwin A.P.I. 3 and A.P.I. 4 oil field chain, made by the Baldwin-Duckworth Chain Corp., Worcester, Mass. It is made to withstand severe service and built in accordance with the American Petroleum Institute standards.

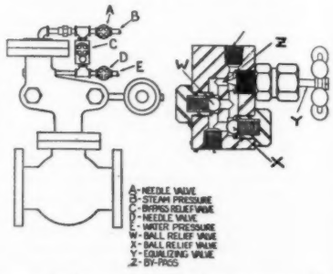
Two side bars, one pin, bushing and roller form the complete link, accurate and tight, with the wear confined to the bearing surfaces designed for that purpose. A.P.I. 3 has a tensile strength of 45,000 pounds, while A.P.I. 4 has a tensile strength of 85,000 pounds.

The links are of rugged design, carefully selected 50 per cent carbon steel, heat treated to gain maximum strength with toughness. Holes are accurately broached to size and true to pitch, their holding power firmly grips the pins and bushings.

To take down the chain it is only necessary to remove one cotter pin and one chain pin. To assemble the chain in the field one chain pin and cotter have to be inserted. Each link is an exact replica of the next.

ELIMINATES EXCESSIVE UNBALANCED PRESSURES

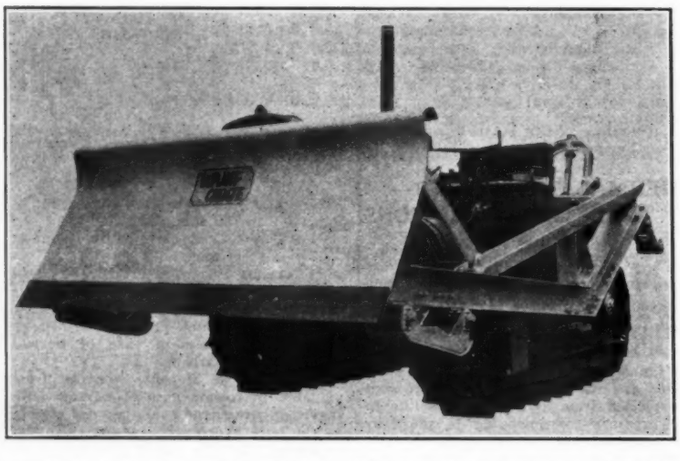
The Northern Equipment Co., Erie, Pa., announces a two-way relief valve to safeguard the actuating element of a pressure control valve against excessive unbalanced pressures. These high unbalanced pressures usually are brought about by water hammer, or they may be encountered when bringing a high-pressure boiler up to operating pressure. The two-way relief valve is installed between the high (steam) and low (water) connections to the pressure control valve as shown.



In the cross-section illustrated the springs holding balls W and X are set for a maximum differential pressure of 200 pounds. In normal operation, the equalizing needle valve Y is closed, shutting off passage Z. Should steam pressure become more than 200 pounds greater than the water pressure, ball W is moved from its seat and forced against the spring. This permits sufficient water to flow through the opening to stabilize the pressure differential at 200 pounds. With the pressure thus stabilized, ball W is forced back into its seat by the spring. Should the water pressure become more than 200 pounds greater than the steam pressure, the excessive pressure is relieved by moving ball X from its seat until the pressure differential is stabilized at 200 pounds. Thus, the actuating element of the pressure control valve is protected against unbalanced pressures of more than 200 pounds, regardless of changes in steam or water pressures.

Valve Y is simply a hand-operated needle valve provided to equalize the pressures when the pressure control valve is cut out of service. This is done by opening valve Y and thus opening passage Z. Needle valves B and C are used to throttle the pressures in the steam and water connections, thus preventing "hunting" caused by rapid pressure fluctuations. Further details on the application of this two-way relief valve may be obtained from the manufacturer.

HYLIFT BULLDOZER EMBODIES INTERESTING FEATURES



With the increase in earth-moving jobs in connection with pipe line construction and various oil field projects, demand has been created for a bulldozer embodying new features. With a view of meeting this demand the LaPlant-Choate Manufacturing Co., Cedar Rapids, Iowa, has developed the Hylift bulldozer, containing the following features:

An extra-high lift which permits the blade to be raised 33 inches above the ground level.

A new-type H main frame design and high lift mechanism at the rear of the tractor, which allows the blade to drop 18 inches below the track ground line.

A double-acting jack which forces the blade into the ground or raises it quickly in hard going.

A unit with the blade and jack built compactly to the tractor to facilitate its use in close quarters.

A design which leaves the tractor drawbar entirely in the clear, so that it may be used for hauling wagons or other equipment without removing the bulldozer.

A complete ground clearance when the blade is raised prevents the unit from "high-centering" on the bulldozer main frame.

The features, with those already embodied in the LaPlant-Choate bulldozers, are designed to make this piece of equipment practical, useful and lasting.

LaPlant-Choate oil field wagons, readily attached to the Hylift bulldozer, are constructed so that they can be used either singly or in train. When it is desired to convert the oil wagon into a cart, the front wheels and gear can be removed quickly and easily.

LaPlant-Choate "Roadlayer" track assemblies can be obtained with a straight main axle, complete with two frame axle brackets, two hub caps and axle pins in the 4-ton, 6-ton, 10-ton and 15-ton tracks. These assemblies can be obtained in 60-inch, 72-inch and 82-inch tread. The track assemblies in all the foregoing sizes and tread widths, can be obtained also with a raised arched type main axle complete with two offset frame axle brackets, hub caps and axle pins. These assemblies can be obtained for mounting on various types of cart and wagon bodies.

NEW TYPE OF MOTOR IS INTRODUCED BY WAGNER

The Wagner type RG motors, announced by the Wagner Electric Corp., St. Louis, Mo., are repulsion-induction motors according to NEMA classification—that is, the rotor in addition to having a wire winding also has "a permanently short-circuited squirrel-cage winding." The salient characteristics of the motor, as enumerated by the company are:

1. Exceptional torque characteristics; a smooth speed-torque curve, without abrupt fluctuations, throughout the entire operating range—well adapted for severe starting duty. 2. Low starting-current. 3. Close speed-regulation. 4. Positive operation on low voltage. 5. Excellent efficiency. 6. High power-factor. 7. Excellent commutation; long brush-life. 8. No internal short-circuiting or brush-lifting mechanism.

Oil Industry Equipment and Supplies

FOOTE ADDS TO SERIES OF "HYGRADE" REDUCERS

Foote Brothers Gear & Machine Co., 215 North Curtis Street, Chicago, has announced an addition to its series of "Hygrade" worm-gear speed reducers, designed to transmit up to 14 horsepower continuous duty, this capacity depending on driving shaft speed and the reduction ratio.

The new unit, designated as size 5-HG, fills a gap between sizes 4-HG and 6-HG which in special cases could not be met economically by use of either of these

last mentioned units. Like the other sizes in this line, the new reducer will be built in five types, HGS, having worm at bottom; HGT, with worm on top; HGV, with worm gear shaft vertical; HGX, consisting of worm reducer with helical attachment, and HGD, having double worm and worm gear reduction. A wide range of ratios is available, varying from 3.5 to 1 to 3,000 to 1.

All shafts in the "Hygrade" worm-gear speed reducers are heat-treated alloy steel, mounted on high-grade oversize antifriction bearings, usually SKF thrust and radial ball bearings on worm shaft and Timken tapered roller bearings on worm gear shaft. Bearings permit hung load of 1,750 pounds on the slow speed shaft of the vertical type of the 5-HG size. Maximum chain pull of slow speed shaft is 1,375 pounds in this size.

The worm and its shaft are machined from a single nickel steel forging, carburized, heat-treated, hardened, ground and polished to precision finish. The gear is hobbed from a special bronze of high tensile strength but possessing best antifriction properties. Tooth form is of a special involute type so cut that the line of contact gives a minimum sliding action and maximum rolling action. The base of the reducer is cast integrally with the housing and it has drilled bolt holes for mounting on a foundation.

TORQUE AND TENSION

A report of interest to designers, manufacturers and users of equipment in the petroleum industry released by the Bureau of Standards, Washington, D. C., is Research Paper No. 386, "The Relation of Torque to Tension for Thread-locking Devices." This report covers the investigations carried on by the Bureau of Standards to determine, under static loads, the torsional resistance to unscrewing of nuts, with and without locking devices, and the relationships these torques bear to the stresses in the bolt. The torque required to produce a given stress in the bolt was also determined for each device. Copies can be obtained from the Superintendent of Documents, Washington, D. C., or the Dardelet Threadlock Corp., 120 Broadway, New York.

NOTES ABOUT TRADE LITERATURE

Two interesting publications issued by the General Electric Co., Schenectady, N. Y., are "G-E Thrustors," a 24-page booklet, and "G-E Electric Steam Generators," a 16-page booklet. Both are sent on request.

In the latest bulletin of the Foxboro Co., Foxboro, Mass., "Orifice Meters for Gas," particular attention is called to the description of the Foxboro 20-inch meter. It is asserted that this instrument makes it possible to meet the requirements of the A.G.A. for measuring gas at low static pressure without sacrificing ruggedness, dependability, accessibility or accuracy.

The Murdock Manufacturing & Supply Co., Cincinnati, Ohio, is distributing a folder describing the company's Q.O.C. air valve.

The Taylor Forge & Pipe Works, Chicago, has prepared a bulletin, No. 32-1, tabulating its newest dimensional and list price data on forge seamless steel fittings for welding and on forge flanges.

Bulletin No. 101, issued by the Ludlow Valve Manufacturing Co., Troy, N. Y., describes the new Ludlow multivalve.

Metallizing, a process by which a coating of rust-proof material is sprayed with a metallizing gun on surfaces to preserve them, is being sent out by the Metallizing Co. of Los Angeles, Ltd., Los Angeles, Calif.

Bulletin 45, prepared by the Semet-Solvay Engineering Corp., 40 Rector Street, New York, is a 12-page booklet in colors devoted to the company's Koller type gas producer.

The Electro Metallurgical Co. (unit of the Union Carbide & Carbon Corp.), 30 East Forty-second Street, New York, has prepared a bulletin on chrome-vanadium nitriding steel which will be sent on request.

Type M double section multistage pumps are described and illustrated in a 16-page bulletin (1642-B) published by the Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

The Chain Belt Co., Milwaukee, Wis., has ready for distribution its catalog No. 440, describing and illustrating Rex roller chains and sprockets. The catalog, a strongly bound book of 112 pages, contains much engineering data of value.

"Two weeks ago we were talking 'no business for 60 days,' but I believe 1932 buying has started and will continue to increase," says the Columbian Employe Magazine, published by the Columbian Steel Tank Co., Kansas City, Mo.

BETTER MAGNET SYSTEM PERFECTED BY ASKANIA

Magnetometer work long has been handicaped by temperature effects in magnetometer field readings, which made really accurate field work practically impossible. With the increased demand for accurate magnetic surveys, particularly in areas where only small magnetic disturbances occurred, a closer study of the problem of temperature compensation on magnetic systems for Askania magnetometers had to be made and it was found that with the proper selection of material and design an improvement in the temperature effect could be obtained. The new Askania Magnet system is said to be a marked improvement over the previous type.

Instead of the aluminum cube as on the old system, a gold-plated iron frame is now furnished to hold the two magnetized gold-plated steel blades together. The lateral screws are also of a different construction. The threaded bars holding the lateral screws are made of materials of a high and low temperature coefficient, and with proper adjustment they almost completely compensate the effect of temperature on the system. No change in the sensitivity screw, however, was made. The size of the new system is practically the same as that of the old one, it only being necessary to make slight adjustments to install a new system in an old Askania magnetometer. A small wooden carrying box with iron frame is furnished to protect the system from strong outside influences.

The advantages of the new system are obvious. The operator can proceed from station to station without giving his attention to the temperature, enabling him to work faster and, in the long run, more economically. Further details can be obtained from the American Askania Corp., 809 M. & M. Building, Hoston, Tex.

NEW TYPE OF HOUSING FOR NORDSTROM VALVE

As a measure of economy to eliminate the necessity of building expensive vaults for subsurface valve installations, a new type of housing has been developed for Nordstrom valves, to protect the gears properly. A cast-iron gear housing and road box now can be furnished for all Nordstrom spur-gear operated valves, according to the manufacturers. This permits burial of the valves within an enclosure that fits snugly around the operating parts.

Lubrication can be supplied to the valve from the surface by attachment of a low head extension projecting to the surface from the valve. Details are included in a new catalog recently produced by the Merco Nordstrom Valve Co., copies of which can be obtained by addressing the company at any of its branch offices or at 343 Sansome Street, San Francisco.

EFFECTS OF TEMPERATURE

The American Society for Testing Materials has prepared a symposium on "Effect of Temperature on the Properties of Metals," an 825-page book published jointly by that society and the American Society of Mechanical Engineers. This report covers the work of a joint committee from the two societies. The book is divided into two general sections, one dealing with engineering trends and requirements for metals at high and low temperatures and the other with the properties of available metals for high and low temperature service. There are a subject index, an author index and a bibliography of 600 annotated references. The book, which costs $6, can be obtained from R. E. Hess, assistant secretary of the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pa., or the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York.

MEN KNOWN *in* THE EQUIPMENT FIELD

L. W. Grothaus, recently appointed to succeed C. E. Searle as general representative of the Allis-Chalmers Manufacturing Co., became affiliated with that organization when it acquired the Bullock

L. W. Grothaus

Electric Manufacturing Co., Norwood, Ohio, in 1904. Mr. Grothaus was transferred to the Allis-Chalmers home office in Milwaukee, Wis., in 1908, which made possible a thorough knowledge of all of the products manufactured by the company. In 1913 he became sales engineer in the Milwaukee district under the leadership of Mr. Searle, and continued in that capacity until 1917, when his services were loaned to the Government as a member of the staff of the War Industries Board. Owing to his thorough knowledge of the electrical and power-generating machinery his duties included allocation of the capacity of the steam turbine industry to the war needs of the Army, Navy, Emergency Fleet Corp., etc. He remained a member of the War Industries Board until December 31, 1918. Returning to the company, he was made manager of the Minneapolis district office and, later, given charge of the Cleveland sales district. He next was promoted to assistant manager of the electrical department of Norwood works, and in the fall of 1929 he was transferred again to the home office in Milwaukee, to take up new duties as assistant manager of the electrical department.

LARGEST ANNEALING FURNACE

The Struthers Wells-Titusville Corp. recently placed in operation at its Warren, Pa., works what is said to be the largest annealing furnace of its kind in the world, the dimensions of which are 18'x18'x87'. It is of the car type and to be used in stress relieving fusion welded pressure vessels and annealing welded alloy steel equipment at temperatures as high as 2,150° F.

"Struthers-weld" is a development of the Struthers Wells-Titusville Corp. for welding carbon and alloy steels. It is said to produce a weld and impart to the adjacent metal greater physical and finer chemical characteristics and greater resistance to corrosion than the plate itself.

REPORT OF THE BUREAU OF MINES FOR THE MONTH OF DECEMBER, 1931

SUPPLY AND DEMAND OF ALL OILS

(Including wax, coke and asphalt in thousands of barrels of 42 U. S. gallons)

	Dec., 1931	Nov., 1931	Dec., 1930	Jan.-Dec., 1931	Jan.-Dec., 1930
NEW SUPPLY:					
Domestic production:					
Crude petroleum	73,174	72,851	66,972	850,275	898,011
Daily average	2,360	2,428	2,160	2,329	2,460
Natural gasoline	3,476	3,405	4,271	42,966	52,631
Benzol	133	135	183	1,929	2,689
Total production	76,783	76,391	71,426	895,170	953,331
Daily average	2,477	2,546	2,304	2,453	2,612
Imports:					
Crude petroleum	4,315	3,604	4,727	47,250	62,129
Refined products	2,903	2,579	3,310	38,832	43,489
Total new supply, all oils	84,001	82,574	79,463	981,252	1,058,949
Daily average	2,710	2,752	2,563	2,688	2,901
Increase in stocks, all oils	3,046	2,762	*6,377	*43,513	*24,000
DEMAND:					
Total demand	80,955	79,812	85,840	1,024,765	1,082,949
Daily average	2,611	2,660	2,769	2,808	2,967
Exports:					
Crude petroleum	1,071	2,449	1,339	25,546	23,705
Refined products	6,102	8,068	9,728	98,969	132,794
Domestic demand	73,782	69,295	74,773	900,250	926,450
Daily average	2,380	2,310	2,412	2,466	2,538
Excess of daily average domestic production over domestic demand	97	336	†108	†13	74
STOCKS (end of month):					
Crude petroleum:					
East of California	329,116	327,138	368,484	329,116	368,484
California‡	135,388	135,941	143,746	135,388	143,746
Total crude	464,504	463,079	512,230	464,504	512,230
Natural gasoline	2,818	2,586	2,377	2,818	2,377
Refined products	154,662	153,273	150,890	154,662	150,890
GRAND TOTAL STOCKS, ALL OILS	621,984	618,938	665,497	621,984	‖665,497
Days' supply	238	233	240	222	224
Bunker oil (included above in domestic demand)	3,447	3,060	3,868	43,714	50,773

*Decrease. †Deficiency. ‡Includes residual fuel oil. ‖To be revised in forthcoming preliminary summary. Revisions for California introduced in September report (crude, +2,271,000; natural gasoline, +915,000; gasoline, —785,000; gas oil, —200,000; unfinished, +200,000; total, +2,401,000 bbls.) will be carried back to December 31, 1930.

COMPARATIVE ANALYSIS

(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931 Total	Dec., 1931 Dly. av.	Nov., 1931 Total	Nov., 1931 Dly. av.	Jan.-Dec., 1931	Jan.-Dec., 1930
CRUDE PETROLEUM:						
Runs to stills: Domestic	69,374	2,238	68,010	2,267	846,685	866,615
Foreign	3,347	108	3,357	112	46,937	60,832
Total	72,721	2,346	71,367	2,379	893,622	927,447
Imports	4,315	139	3,604	120	47,250	62,129
Exports	1,071	35	2,449	82	25,546	23,705
MOTOR FUEL:						
Production	36,051	1,163	36,137	1,205	437,888	440,728
Imports	793	26	586	20	13,621	16,927
Exports	2,691	87	3,743	125	45,832	65,575
Stocks*	42,320	....	38,696	....	42,320	40,541
Domestic demand	30,529	985	30,640	1,021	403,313	394,800
KEROSENE:						
Production	3,713	120	3,815	127	42,446	49,208
Imports	....	....	....	....	10	200
Exports	641	21	1,215	41	12,706	16,884
Stocks	5,332	....	5,618	....	5,332	6,883
Domestic demand	3,358	108	2,906	97	31,301	34,736
GAS OIL AND DISTILLATE FUELS:						
Production	6,751	218	6,631	221	88,286	81,551
Stocks	18,526	....	20,469	....	18,526	16,390
RESIDUAL FUEL OILS:						
Production	20,526	662	20,495	683	259,353	290,947
Stocks†	24,056	....	24,965	....	24,056	20,617
GAS OIL AND FUEL OIL:						
Production	27,277	880	27,126	904	347,639	372,498
Imports	2,084	67	1,961	65	24,998	26,080
Exports	1,949	63	2,209	74	29,229	36,450
Stocks	42,582	....	45,434	....	42,582	37,007
LUBRICANTS:						
Production	2,949	66	2,164	72	26,704	34,201
Imports	3	....	3	....	31	25
Exports	597	19	647	22	8,130	9,935
Stocks	9,511	....	9,422	....	9,511	10,971
Domestic demand	1,366	44	1,211	40	20,065	21,589
WAX (thousands of pounds):						
Production	45,360	1,463	46,760	1,559	477,400	547,680
Imports	6,428	207	5,775	193	37,084	30,402
Exports	38,667	1,247	30,585	1,020	290,526	292,973
Stocks	180,843	....	183,938	....	180,843	232,592
Domestic demand	16,216	523	27,179	906	275,707	242,109
COKE (short tons):						
Production	167,600	5,406	168,000	5,600	2,031,600	1,940,000
Stocks	1,511,600	....	1,439,000	....	1,511,600	1,069,100
ASPHALT (short tons):						
Production	121,600	4,245	209,600	6,987	2,976,500	3,308,000
Stocks	301,800	....	299,200	....	301,800	307,800
ROAD OIL:						
Production	84	3	135	5	5,177	5,425
Stocks	333	....	378	....	333	189
MISCELLANEOUS:						
Production	3,022	97	2,664	89	16,196	7,754
Stocks	785	....	714	....	785	530

*Includes motor fuel blends held at natural gasoline plants and in gasoline pipe line systems. †East of California.

PRODUCTION OF CRUDE PETROLEUM BY FIELDS, WITH CLASSIFICATION BY GRAVITY

(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931 Total	Dec., 1931 Dly. av.	Nov., 1931 Total	Nov., 1931 Dly. av.	Jan.-Dec., 1931	Jan.-Dec., 1930
FIELD:						
Appalachian:						
Pennsylvania Grade	2,026	65	1,882	63	21,884	24,242
Other (including Kentucky)	681	22	758	25	8,452	9,862
Lima, northeast Indiana, Michigan	568	18	506	17	4,934	5,276
Illinois, southwest Indiana	513	16	493	16	5,825	6,677
Mid-Continent:						
North Louisiana and Arkansas	1,798	58	1,886	63	27,106	34,364
West Texas-Southeast New Mex.	7,091	229	7,297	243	93,498	118,398
Other (Okla., Kans., N. Tex., etc.)	38,958	1,257	39,004	1,300	422,210	378,785
Gulf Coast:						
Grade A	1,403	45	1,345	45	18,231	29,910
Grade B	3,057	99	3,179	106	39,563	39,766
Rocky Mountain	1,518	49	1,503	50	19,742	*23,501
California	15,561	502	14,998	500	188,330	227,329
Total	73,174	2,360	72,851	2,428	850,275	898,011

*Includes Alaska and Utah.

Note—Production of heavy crude November 5, 865,000 bbls.; December 5, 970,000 bbls.

PRODUCTION OF CRUDE PETROLEUM BY STATES

(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931 Total	Dec., 1931 Dly. av.	Nov., 1931 Total	Nov., 1931 Dly. av.	Jan.-Dec., 1931	Jan.-Dec., 1930
Arkansas	963	31	1,041	35	14,835	19,702
California:						
Kettleman Hills	1,851	60	1,800	60	17,544	6,269
Long Beach	2,365	76	2,263	75	30,167	36,609
Santa Fe Springs	1,970	64	1,873	62	24,273	44,251
Rest of State	9,375	302	9,062	303	116,846	140,269
Total California	15,561	502	14,998	500	188,830	227,329
Colorado	126	4	115	4	1,550	1,656
Illinois	445	14	429	14	5,023	5,736
Indiana:						
Southwestern	68	2	64	2	802	941
Northeastern	3	...	3	...	38	53
Total Indiana	71	2	67	2	840	994
Kansas	3,183	103	3,063	102	36,885	41,638
Kentucky	514	17	602	20	6,400	7,389
Louisiana:						
Gulf Coast	923	30	932	31	9,571	8,610
Rest of State	835	27	845	28	12,271	14,662
Total Louisiana	1,758	57	1,777	59	21,842	23,272
Michigan	476	15	425	14	3,791	3,911
Montana	212	7	192	6	2,865	3,349
New Mexico	1,313	4	1,324	44	15,239	10,189
New York	338	11	291	10	3,431	3,647
Ohio:						
Central and eastern	344	11	322	10	4,212	5,174
Northwestern	89	3	78	3	1,105	1,312
Total Ohio	433	14	00	13	5,317	6,486
Oklahoma:						
Oklahoma City	5,245	169		179	47,306	34,602
Seminole	4,359	141		151	47,871	66,217
Rest of State	7,383	238	6	212	85,632	115,666
Total Oklahoma	16,987	548	16,.	542	180,809	216,486
Pennsylvania	1,129	36	1,0.	36	11,815	12,802
Tennessee	.....	...	...	...	6	21
Texas:						
Gulf Coast	3,537	114	3,592	0	48,223	61,066
West Texas	5,819	188	6,021		78,805	108,730
East Texas	11,090	358	12,019		107,990	120,661
Rest of State	7,698	248	7,665		96,526	
Total Texas	28,144	908	29,297	9.7	331,544	290,457
West Virginia	382	12	352	12	4,472	5,071
Wyoming:						
Salt Creek	686	22	664	22	8,839	10,531
Rest of State	453	15	484	16	5,952	7,337
Total Wyoming	1,139	37	1,148	38	14,791	17,868
Total United States	73,174	2,360	72,851	2,428	850,275	*898,011

*Includes Alaska and Utah.

INDICATED DOMESTIC DEMAND FOR CRUDE PETROLEUM EAST OF CALIFORNIA

(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931 Total	Dec., 1931 Dly. av.	Nov., 1931 Total	Nov., 1931 Dly. av.	Jan.-Dec., 1931	Jan.-Dec., 1930
Domestic petroleum by fields of origin:						
Appalachian:						
Pennsylvania Grade	1,860	60	1,985	66	23,168	23,492
Other (including Kentucky)	559	18	732	24	8,270	9,959
Lima, northeast Indiana, Michigan	371	12	525	18	4,667	4,536
Illinois-southwest Indiana	537	17	464	15	6,248	6,991
Mid-Continent:						
North Louisiana and Arkansas	2,977	96	2,848	95	32,864	36,764
West Texas-southeast New Mex.	8,389	271	7,491	250	105,484	125,936
Other (Okla., Kans., N. Tex., etc.)	35,791	1,154	36,234	1,208	434,272	384,928
Gulf Coast:						
Grade A	1,453	47	1,573	52	23,005	32,616
Grade B	3,278	106	3,437	115	41,859	39,423
Rocky Mountain	1,321	43	1,657	55	21,612	22,679
California	.....	...	.....	...	5	209
Total demand	56,536	1,824	56,947	1,898	701,454	687,531
Exports	602	20	1,528	51	17,981	15,332
Domestic demand	55,934	1,804	55,419	1,847	683,473	672,199
Foreign petroleum	3,414	110	3,478	116	46,609	64,361
Total domestic demand east of California	59,348	1,914	58,897	1,963	730,082	736,560

STOCKS OF CRUDE PETROLEUM

(Thousands of barrels of 42 U. S. gallons)

	Dec. 31, 1931	Nov. 30, 1931	Dec. 31, 1930
EAST OF CALIFORNIA:			
At refineries by location:			
East Coast: Domestic	7,709	8,560	10,461
Foreign	3,694	2,666	2,816
Appalachian	1,956	1,942	2,505
Indiana, Illinois, Kentucky, Michigan, etc.	3,553	3,145	2,541
Oklahoma, Kansas and Missouri	5,537	5,155	4,955
Texas: Inland	1,954	1,776	1,320
Gulf Coast: Domestic	6,453	7,112	7,763
Foreign	137	340	342
Arkansas and Inland Louisiana	540	554	813
Louisiana Gulf Coast: Domestic	2,427	2,878	5,242
Foreign	663	587	691
Rocky Mountain	1,923	1,851	1,693
Total	36,546	36,566	41,136
At refineries by origin:			
Pennsylvania Grade	1,689	1,817	2,220
Other Appalachian (including Kentucky)	690	706	786
Lima, northeast Indiana, Michigan	261	233	85
Illinois-southwest Indiana	121	98	86
North Louisiana and Arkansas	1,734	1,882	4,483
West Texas and southeast New Mexico	3,257	3,516	5,311
Oklahoma, Kansas, North Texas, etc.	17,554	17,617	15,537
Gulf Coast: Grade A	1,523	1,521	2,742
Grade B	3,482	3,905	3,241
Rocky Mountain	1,741	1,678	1,688
California	.....	.....	5
Foreign	4,494	3,593	3,858
Total	36,546	36,566	41,136
Pipe line and tank farm:			
Pennsylvania Grade	4,928	4,634	5,581
Other Appalachian (including Kentucky)	1,188	1,050	911
Lima, northeast Indiana, Michigan	1,560	1,387	1,453
Illinois-southwest Indiana	9,790	9,834	10,252
North Louisiana and Arkansas	16,980	17,995	19,957
West Texas and southeast New Mexico	35,436	36,460	45,414
Oklahoma, Kansas, North Texas, etc.	179,548	176,571	193,768
Gulf Coast: Grade A	4,117	4,170	6,629
Grade B	9,198	8,998	11,626
Rocky Mountain	23,275	23,123	25,140
Total	286,020	284,222	320,740
Total refinery, pipe line and tank farm	322,566	320,788	361,876
Producers' stocks	6,550	6,250	6,608
Total crude east of California	329,116	327,138	368,484
CALIFORNIA: Light	42,114	40,471	40,225
Heavy (including fuel)	93,274	95,470	103,421
Total crude (including fuel oil in California)	464,504	463,079	*512,230

*See fourth footnote under "Supply and Demand of All Oils."

Note—Stocks of heavy crude east of California: November, 23,077,000 bbls.; December, 23,639,000 bbls.

SHIPMENTS FROM CALIFORNIA TO EASTERN PORTS IN UNITED STATES*
(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931	Nov., 1931	Dec., 1930	Jan.-Dec., 1931	Jan.-Dec., 1930
Gasoline	1,262	1,106	1,276	13,854	18,473
Natural gasoline	73	281	226	1,748	1,713
Kerosene	....	....	80	194	278
Gas oil	95	94	342	1,703	4,141
Diesel oil			...		208
Fuel oil	....	....	3	2	38
Lubricants	10	5	3	84	131
Asphalt	1	1	1	15	20
Total	1,441	1,487	1,931	17,605	25,002

*Compiled by E. T. Knudsen of the San Francisco office of the Bureau of Mines.

RECORD OF WELLS FOR IMPORTANT FLUSH FIELDS, DECEMBER, 1931*

	Completions: Oil	Gas	Dry	Barrels: Ttl. initial prod.	Av. initial prod.	Drlg. Dec. 31
Texas	537	15	86	73,500	100	724
East Texas	447	1	8	47,100	100	300
Gulf Coast	14	2	8	10,800	800	67
West Texas	8	..	6	3,100	400	81
California	9	..	36	3,900	400	132
Kettleman Hills	..	..	..	....	....	11
Long Beach	2	..	2	500	300	13
Playa Del Rey	..	..	..	....	....	3
Oklahoma	25	13	16	65,000	2,600	247
Oklahoma County	10	..	..	61,300	6,100	45
Pottawatomie and Seminole Counties	1	..	..	2,600	2,600	15
New Mexico	2	1	1	3,500	1,800	50
Lea County (Hobbs)	1	..	..	3,500	3,500	5
Other states	171	100	101	27,400	200	960
Total United States	744	129	240	173,300	200	2,113

*From The Oil and Gas Journal and California office of the American Petroleum Institute.

GASOLINE PRODUCTION BY THE VARIOUS METHODS, DECEMBER, 1931
(Thousands of barrels of 42 U. S. gallons)

	Straightrun: Total	%	Cracked: Total	%	Natural gasoline: Total	%	Grand total
East Coast	2,864	45	3,338	53	122	2	6,324
Appalachian	771	53	654	45	38	2	1,463
Indiana, Illinois, Kentucky, etc.	2,684	49	2,554	46	283	5	5,521
Oklahoma, Kansas, Missouri	2,211	50	1,769	40	444	10	4,424
Texas	4,347	49	3,844	43	742	8	8,933
Louisiana and Arkansas	1,194	53	911	40	162	7	2,267
Rocky Mountain	387	44	396	45	93	11	876
California	3,354	58	1,589	28	812	14	5,755
Total	17,812	50	15,055	42	2,696	8	35,563
Texas Gulf Coast	3,016	46	3,049	47	438	7	6,503
Louisiana Gulf Coast	845	52	671	41	110	7	1,626

RUNS TO STILLS AND OUTPUT OF REFINERIES, DECEMBER, 1931
(Thousands of barrels of 42 U. S. gallons)

INPUT:	Crude oil: Domestic	Foreign	Total	Unfinished oils	Natural gasoline rerun	Total input
East Coast	10,724	3,260	13,984	781	122	14,887
Appalachian	2,849	.....	2,849	201	38	3,088
Indiana, Illinois, Kentucky, etc.	9,296	.....	9,296	342	283	9,921
Oklahoma, Kansas, Missouri	7,652	.....	7,652	360	444	8,456
Texas	17,787	39	17,826	1,019	742	19,587
Louisiana and Arkansas	5,315	48	5,363	288	162	5,813
Rocky Mountain	1,224	.....	1,224	326	93	1,643
California	14,527	.....	14,527	885	*812	16,224
Total United States	69,374	3,347	72,721	4,202	2,696	79,619
Texas Gulf Coast	13,543	39	13,582	895	438	14,915
Louisiana Gulf Coast	3,594	48	3,642	13	110	3,765

OUTPUT:	Gasoline	Kerosene	Gas oil and distillate	Residual fuel oils	Total	Lubricants	Wax‡
East Coast	6,324	702	864	4,764	5,628	702	19,880
Appalachian	1,463	286	238	203	441	355	7,840
Indiana, Illinois, Kentucky, etc.	5,521	300	899	1,228	2,127	160	3,920
Oklahoma, Kansas, Missouri	4,424	632	758	1,413	2,171	212	1,960
Texas	8,933	977	1,575	4,676	6,251	449	3,640
Louisiana and Arkansas	2,267	480	542	1,577	2,119	50	5,880
Rocky Mountain	876	54	64	193	257	28	2,240
California	5,755	282	1,811	6,472	8,283	93	.....
Total United States	35,563	3,713	6,751	20,526	27,277	2,049	45,360
Texas Gulf Coast	6,503	774	1,362	3,377	4,739	432	3,080
Louisiana Gulf Coast	1,626	410	386	907	1,293	31	5,880

OUTPUT (continued):	Tons: Coke	Asphalt	Road oil	Miscellaneous products	Unfinished products	Shortage
East Coast	9,200	43,800	8	690	233	241
Appalachian	3,500	12,700	...	194	124	109
Indiana, Illinois, Kentucky, etc.	57,600	23,100	7	680	653	38
Oklahoma, Kansas, Missouri	31,200	2,900	12	254	260	309
Texas	46,100	9,100	1	924	1,370	384
Louisiana and Arkansas	5,100	14,400	...	109	521	141
Rocky Mountain	12,400	.....	25	66	238	28
California	2,500	25,600	31	105	1,218	303
Total United States	167,600	131,600	84	†3,022	4,617	1,553
Texas Gulf Coast	35,300	9,100	1	841	1,230	154
Louisiana Gulf Coast	4,900	8,200	...	80	195	50

*Includes 78,000 bbls. run through pipe lines. †Production of miscellaneous products east of California in December, 1931, includes still gas equivalent on a B.t.u. basis to 2,768,000 bbls. of fuel oil. In the forthcoming preliminary summary, figures for still gas will be segregated for the entire year 1931. ‡In thousands of pounds.

PRODUCTION AND DISTRIBUTION OF NATURAL GASOLINE
(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931: Total	Dly. av.	Nov., 1931: Total	Dly. av.	Jan.-Dec.,'31: Total	Dly. av.
Production	3,476	112	3,405	113	42,966	118
Decrease in all stocks	.....	...	.....	...	*475	1
Total	3,476	112	3,405	113	43,441	119
Blended at refineries	2,618	84	2,878	96	33,974	93
Blended at plants east of California	5	...	10	...	149	...
Run through pipe lines in California	78	3	81	3	1,142	3
Jobbers, exports, etc.	350	11	200	7	4,250	12
Increase in all stocks	232	8	9	...	.....	...
Balance	193	6	227	7	3,926	11
Total	3,476	112	3,405	113	43,441	119

*See fourth footnote under "Supply and Demand of All Oils."

SHIPMENTS OF MOTOR FUEL BY PIPE LINES
(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931	Nov., 1931	Jan.-Dec., 1931
Motor fuel turned into lines	1,930	1,847	14,677
Motor fuel delivered from lines	1,721	1,678	12,766
Stocks in lines and working tanks end of month	2,111	1,902	2,111

IMPORTS AND EXPORTS OF CRUDE PETROLEUM AND MAJOR REFINED PRODUCTS*
(Thousands of barrels of 42 U. S. gallons)

CRUDE PETROLEUM:	Dec., 1931: Total	Dly. av.	Nov., 1931: Total	Dly. av.	Jan.-Dec., 1931	Jan.-Dec., 1930
Imports	4,315	139	3,604	120	47,250	62,129
From Mexico	353	11	994	33	8,208	10,093
From Venezuela	2,064	67	1,734	58	25,222	35,080
From Colombia	1,775	57	814	27	12,329	14,204
From other countries	123	4	62	2	1,491	2,752
Exports:						
Domestic crude oil	1,071	35	2,449	82	25,546	23,705
To Canada	731	24	1,810	61	19,209	18,967
To other countries	340	11	639	21	6,337	4,737
Shipments	.....	...	.....	...	.....	1
Foreign crude oil	.....	...	.....	...	.....	.....
REFINED PRODUCTS:						
Gasoline:						
Imports	793	26	586	20	13,621	16,927
Exports†	2,691	87	3,743	125	45,832	65,575
To United Kingdom	1,056	34	703	23	13,246	19,489
To France	84	3	840	28	6,133	9,348
To Canada	159	5	226	8	2,950	4,282
To other countries	1,241	40	1,954	65	21,980	31,138
Shipments	151	5	20	1	1,523	1,318
Kerosene:						
Exports:	641	21	1,215	41	12,706	16,884
To China	26	1	72	2	1,707	2,412
To United Kingdom	186	6	357	13	2,881	2,946
To other countries	428	14	777	26	7,945	11,332
Shipments	1	...	9	...	173	194
Gas oil and fuel oil:						
Imports	2,084	67	1,961	65	24,998	26,080
Exports	1,949	63	2,209	74	29,229	36,450
To Japan	403	13	411	14	5,437	5,694
To Chile	145	5	169	6	2,926	4,262
To other countries	1,162	37	1,478	49	18,225	22,422
Shipments	239	8	151	5	2,641	4,072
Lubricants:						
Exports	597	19	647	22	8,130	9,935
To United Kingdom	90	3	171	6	1,759	2,099
To France	164	5	72	3	1,402	1,474
To other countries	339	11	398	13	4,890	6,276
Shipments	4	...	6	...	79	86
Wax (thousands of pounds):						
Imports	6,428	207	5,775	193	37,084	30,402
Exports	38,667	1,247	30,585	1,020	290,526	292,973
To United Kingdom	5,948	192	8,552	285	66,613	79,560
To Italy	3,329	107	5,027	168	42,845	44,923
To other countries	29,382	948	16,997	567	181,025	168,449
Shipments	8	...	9	...	43	41

*From Bureau of Foreign and Domestic Commerce. †Includes benzol—9 bbls. in December.

PRODUCTION OF MOTOR FUEL
(Thousands of barrels of 42 U. S. gallons)

	Dec., 1931: Total	Dly. av.	Nov., 1931: Total	Dly. av.	Jan.-Dec., 1931	Jan.-Dec., 1930
Straightrun gasoline	17,812	575	17,800	594	220,263	224,628
Cracked gasoline	15,055	486	15,024	501	176,181	164,443
Natural gasoline:						
Blended at refineries	2,618	84	2,878	96	33,974	41,501
Blended at plants*	5	...	10	...	149	253
Run through pipe lines†	78	3	81	3	1,142	1,669
Jobbers, exports, etc.	350	11	200	7	4,250	5,545
Benzol produced‡	133	4	135	4	1,929	2,689
Total motor fuel	36,051	1,163	36,137	1,205	437,888	440,728

*East of California. †To refineries in California. ‡Estimated.

NUMBER OF WELLS COMPLETED IN THE UNITED STATES*

	Dec., 1931	Nov., 1931	Dec., 1930	Jan.-Dec., 1931	Jan.-Dec., 1930
Oil	744	874	540	6,748	11,640
Gas	129	161	275	1,927	2,866
Dry	240	253	477	3,670	6,726
Total	1,113	1,288	1,292	12,345	21,232

*From The Oil and Gas Journal and California office of the American Petroleum Institute.

STOCKS HELD BY REFINING COMPANIES, DECEMBER, 1931*
(Thousands of barrels of 42 U. S. gallons)

	Gasoline	Kerosene	Gas oil and fuel oil: Gas oil and distillate fuels	Residual fuel oils	Total
East Coast	4,589	899	4,009	4,373	8,382
Appalachian	1,426	231	887	699	1,586
Indiana, Illinois, Kentucky, etc.	5,706	638	2,272	2,838	5,110
Oklahoma, Kansas, Missouri	3,452	438	2,421	2,572	4,993
Texas	8,198	947	3,622	9,521	13,143
Louisiana and Arkansas	1,402	345	780	3,625	4,405
Rocky Mountain	1,830	352	358	428	786
California	13,599	1,482	4,177	(†)	4,177
Total	40,202	5,332	18,526	24,056	42,582
Texas Gulf Coast	5,778	844	2,919	6,291	9,210
Louisiana Gulf Coast	1,253	322	613	2,995	3,608

	Lubricants	Wax (thousands of lbs.): Crude scale	Refined	Total	Coke (tons)
East Coast	3,099	30,482	19,658	50,140	22,100
Appalachian	1,145	19,641	2,181	21,822	11,100
Indiana, Illinois, Kentucky, etc.	1,018	18,869	1,653	20,522	215,900
Oklahoma, Kansas, Missouri	753	2,273	2,386	4,659	165,600
Texas	2,155	1,618	13,315	14,933	742,600
Louisiana and Arkansas	132	35,846	1,228	37,074	117,400
Rocky Mountain	250	30,256	1,437	31,693	138,100
California	959	.....	.....	.....	98,800
Total	9,511	138,985	41,858	180,843	1,511,600
Texas Gulf Coast	2,075	1,618	13,235	14,853	611,300
Louisiana Gulf Coast	112	35,846	1,228	37,074	117,200

	Asphalt (tons)	Road oil	Miscellaneous products	Unfinished oils	Natural gasoline
East Coast	87,500	14	81	7,286	83
Appalachian	20,100	10	67	1,490	11
Indiana, Illinois, Kentucky, etc.	79,100	12	281	6,277	47
Oklahoma, Kansas, Missouri	3,900	88	24	3,224	29
Texas	11,400	11	14	12,717	278
Louisiana and Arkansas	52,100	...	13	2,391	8
Rocky Mountain	2,300	89	49	1,553	1
California	45,400	109	256	†8,846	1,716
Total	301,800	333	785	43,784	2,173
Texas Gulf Coast	11,300	11	8	11,494	273
Louisiana Gulf Coast	28,900	...	5	1,833	2

*Stocks east of California represent inventories held by refining companies at or near refineries; California stocks represent inventories held by refining companies on the Pacific Coast of the United States at refineries, at or in transit to water terminals and bulk distributing stations. †Included with heavy crude, see "Stocks of Crude Petroleum." ‡Includes 4,117,000 bbls. tops.

Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS
Pipe Line Report for Month of December

RUNS

	Month bbls.	Daily av. bbls.
Prairie P. L. Co.*	697,500	22,500
Gulf P. L. Co.	1,965,109	63,391
Texas P. L. Co.	748,985	24,161
Magnolia P. L. Co.	1,734,760	55,960
Empire P. L. Co.	2,468,143	79,618
Cosden P. L. Co.	682,211	22,007
Stanolind P. L. Co.*	3,193,000	103,000
Oklahoma P. L. Co.	2,316,497	74,726
Other lines*	5,990,750	193,250
Total December	19,796,955	638,611
Total November	19,562,416	652,080
Difference	234,539	13,469

SHIPMENTS

Prairie P. L. Co.	2,382,895	76,868
Gulf P. L. Co.	2,047,205	66,039
Texas P. L. Co.	584,385	18,851
Magnolia P. L. Co.	1,290,374	41,625
Empire P. L. Co.	1,515,327	48,882
Cosden P. L. Co.	802,576	25,890
Stanolind P. L. Co.	3,557,622	114,762
Oklahoma P. L. Co.	2,400,708	77,442
Other lines*	4,774,800	154,000
Total December	19,355,129	624,359
Total November	19,829,044	660,985
Difference	473,915	36,626

STOCKS

	Bbls.
Prairie O. & G. Co.*	35,211,000
Gulf P. L.-Gypsy Oil Co.	7,988,187
The Texas Company	3,328,694
Magnolia Petroleum Co.	7,779,567
Empire P. L. Co.	4,589,901
Mid-Continent Pet. Corp.	3,332,588
Stanolind Crude Oil Pur. Co.*	16,583,000
Oklahoma P. L. Co.	1,302,734
Carter Oil Co.	6,494,184
Other lines*	15,463,000
Total December	102,072,255
Total November	100,025,383
Difference	2,046,872

*Estimated.

EASTERN PIPE LINE REPORT FOR MONTH OF JANUARY

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for December and January:

	Dec.,'31	Jan.,'32
Nat. Transit	134,728.53	132,346.98
S. W. Pa. P. L.	78,639.10	64,883.40
Eureka P. L.	364,834.50	264,733.46
Buckeye P. L. (Macksburg)	276,673.59	231,436.17
Buckeye P. L. (Cleveland)	12,125.02	12,765.55
Buckeye P. L. (Lima, etc.)	77,185.73	70,902.02
Indiana P. L.	2,581.64	2,957.69
N. Y. Transit	42,592.82	42,434.50
Tide Water P. L.	24,880.76	21,527.15
Pure Oil	350,431.59	343,184.55
Stoll Oil Ref.	36,806.03	61,955.78
Bradford Tran.	422,865.63	409,404.66
Total	1,916,885.82	1,658,531.92
Daily average	61,835.03	53,501.03

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for December and January:

	Dec.,'31	Jan.,'32
Nat. Transit	554,540.59	546,544.24
S. W. Pa. P. L.	426,018.53	327,706.71
Eureka P. L.	318,074.34	266,906.78
Buckeye P. L. (Macksburg)	233,257.65	247,543.60
Buckeye P. L. (Cleveland)	1,709.74	1,710.80
Buckeye P. L. (Lima, etc.)	1,578,295.69	1,483,164.35
Indiana P. L.	738,240.58	720,776.96
Southern P. L.	61,182.44	45,091.84
N. Y. Transit	176,524.14	160,691.41
Northern P. L.	134,129.64	167,659.81
Tide Water P. L.	272,501.01	582,162.04
Pure Oil	190,150.36	322,591.72
Bradford Tran.	448,373.68	604,570.61
Tuscarora	330,473.61	305,988.46
Total	5,463,472.00	5,783,109.33
Daily average	175,241.03	186,551.91

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of December and January:

	Dec.,'31	Jan.,'32
Nat. Transit	647,268.73	708,300.22
S. W. Pa. P. L.	484,609.86	452,222.36
Eureka P. L.	1,205,561.50	1,218,191.97
Buckeye P. L. (Macksburg)	298,989.13	265,000.88
Buckeye P. L. (Cleveland)	45,401.41	38,126.48
Buckeye P. L. (Lima, etc.)	2,890,304.17	2,936,849.21
Indiana P. L.	543,883.89	520,692.84
Cumberland P. L.	64,500.81	64,500.81
Southern P. L.	229,411.72	258,415.23
N. Y. Transit	145,567.39	198,406.61
Northern P. L.	314,690.06	334,194.85
Tide Water P. L.	1,107,832.07	974,418.35
Pure Oil	803,723.79	887,230.61
Tuscarora	10,793.98	10,920.81
Bradford Tran.	326,488.02	157,443.22
Total	9,119,032.53	8,914.45
Decrease		95,118.08

Grades of Oil

The following table shows the amount of the different grades of oil held by the Eastern pipe lines at the close of December and January, showing gross stocks of the above fields:

	Dec.,'31	Jan.,'32
Pennsylvania	3,289,870.05	3,219,630.21
Lima	598,134.96	602,805.09
Kentucky	74,898.22	74,908.32
Mid-Continent	4,422,734.01	4,306,150.37
Michigan	733,395.19	820,420.46
Total	9,119,032.53	9,023,914.45

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1929	1930	1931	1932
January	51,749	75,907	52,939	53,501
February	51,833	79,256	55,163	.....
March	54,252	76,688	54,331	.....
April	58,444	84,536	54,914	.....
May	59,902	70,546	53,344	.....
June	58,833	75,430	54,110	.....
July	66,087	68,921	50,723	.....
August	66,087	54,291	51,503	.....
September	67,315	56,595	61,345	.....
October	76,093	58,179	65,595	.....
November	74,831	52,332	59,819	.....
December	74,561	53,999	61,835	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1929	1930	1931	1932
January	165,721	217,623	175,369	186,551
February	159,387	224,355	183,494	.....
March	161,474	228,846	189,508	.....
April	169,737	241,845	191,450	.....
May	184,281	248,383	199,247	.....
June	185,404	234,401	221,155	.....
July	194,763	207,094	211,632	.....
August	194,946	205,506	224,166	.....
September	201,214	193,999	217,537	.....
October	191,367	157 675	210 831	.....
November	202,743	146,638	196,425	.....
December	186,257	143,001	176,241	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1930	1931	1932
January	12,220,045	11,831,092	9,023,914
February	12,991,561	11,506,489	.....
March	13,247,217	11,012,162	.....
April	13,233,961	11,044,481	.....
May	13,052,953	10,728,239	.....
June	13,396,855	9,903,349	.....
July	13,265,562	9,569,849	.....
August	13,047,051	9,192,457	.....
September	12,812,018	8,492,431	.....
October	12,437,553	8,417,694	.....
November	11,851,380	8,830,386	.....
December	11,751,952	9,119,032	.....

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, Feb. 1	484,419.77
Runs from wells	476,649.97
Regular deliveries	224,331.04
Other deliveries	200,935.11

The amount of Illinois oil run by the Tide Water Pipe Co. in January was 21,527.15 bbls. Deliveries were 22,303.06 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1932—	Runs	Deliveries
January	500,177.12	246,634.10
1931—		
January	468,429.04	669,573.19
February	429,284.54	461,262.85
March	424,638.23	356,663.20
April	421,814.98	282,532.65
May	433,231.80	322,513.95
June	510,805.78	320,258.12
July	520,009.38	289,219.05
August	476,623.56	393,231.06
September	492,183.83	323,012.50
October	498,124.13	325,834.90
November	470,302.63	281,258.00
December	515,771.28	306,623.10
1930		
January	543,387.95	498,293.80
February	548,416.33	414,536.50
March	631,944.49	469,119.55
April	630,074.22	509,304.60
May	605,147.37	504,069.84
June	572,663.57	468,658.10
July	604,529.54	388,454.67
August	594,642.12	375,742.40
September	457,001.11	371,691.60
October	478,442.12	320,688.70
November	422,794.68	355,403.12
December	556,418.78	363,719.55

Tide Water Pipe Co., Ltd., also delivered in January 293,024.35 bbls. Oklahoma oil.

AVERAGE DAILY IMPORTS OF CRUDE AND REFINED OIL AT PRINCIPAL UNITED STATES PORTS

Average barrels per day in 1931—	ATLANTIC PORTS: Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS: Galveston	New Orleans, Baton Rouge	Port Arthur, Sabine Pass	Tampa	Total	Total all ports
January	17,613	13,519	154,225	32,902	30,612	248,871	2,032	11,677	2,097	3,097	18,903	267,774
February	31,321	16,929	127,786	31,714	26,857	234,607	4,536	11,571	.....	536	16,643	251,250
March	37,645	18,935	141,160	26,290	31,129	235,161	4,065	2,580	.....	1,968	8,613	246,774
April	35,000	10,532	105,000	29,767	35,533	215,833	2,733	3,400	.....	.....	6,133	221,966
May	30,129	8,774	107,000	25,452	26,710	198,065	.....	2,000	.....	.....	2,000	200,065
June	30,067	10,833	111,767	27,000	20,833	200,500	3,300	5,500	2,167	1,333	12,300	212,800
July	26,387	11,226	104,678	29,323	21,773	193,387	6,903	7,419	4,194	.....	18,516	211,903
August	32,613	15,581	91,742	22,387	25,741	188,064	4,161	2,516	.....	3,162	9,839	197,903
September	27,067	7,267	106,867	20,099	22,967	184,267	4,833	8,333	.....	.....	13,166	197,433
October	53,710	14,484	100,774	26,742	40,645	236,355	6,097	6,871	2,097	1,838	16,903	253,258
November	48,033	38,800	51,667	28,600	12,967	170,067	3,933	10,833	2,033	1,367	19,166	189,233
December	20,258	16,806	121,807	31,645	34,258	224,774	1,968	4,355	.....	.....	6,323	231,097

AVERAGE DAILY RECEIPTS OF CALIFORNIA CRUDE AND REFINED OIL AT ATLANTIC AND GULF PORTS

Average barrels per day in 1931—	ATLANTIC PORTS: Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS: Galveston	New Orleans, Baton Rouge	Port Arthur, Sabine Pass	Tampa	Total	Total all ports
January	8,387	6,613	21,968	14,678	11,096	62,742	.....	.....	.....	.....	6,129	68,871
February	5,757	2,713	29,143	4,000	5,750	47,393	.....	.....	.....	.....	3,750	51,143
March	10,032	1,611	21,388	7,324	8,774	49,129	.....	.....	.....	.....	6,355	55,484
April	5,133	.....	19,200	16,500	10,067	50,900	.....	.....	.....	.....	4,000	54,900
May	4,452	3,064	19,903	11,226	6,258	44,903	.....	.....	.....	.....	2,355	47,258
June	4,267	.....	25,100	6,233	3,500	39,200	.....	.....	.....	.....	.....	39,200
July	6,774	1,194	24,612	11,065	9,902	53,548	.....	.....	.....	.....	1,325	54,903
August	3,452	.....	16,419	7,419	4,290	31,580	.....	.....	.....	.....	968	32,548
September	4,267	3,667	12,933	4,699	7,367	32,933	.....	.....	.....	.....	4,000	36,933
October	2,355	1,129	19,290	16,709	9,323	48,806	.....	.....	.....	.....	3,323	52,129
November	1,000	.....	22,800	11,567	.....	35,367	.....	.....	.....	.....	3,366	38,733
December	3,161	.....	22,484	8,839	6,032	40,516	.....	.....	.....	.....	7,742	48,258

GROSS PRODUCTION OF CRUDE OIL IN THE UNITED STATES FOR 12 MONTHS

(In Barrels of 42 Gallons)

1931—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
January:	Month	16,485,738	14,550,953	20,019,212	3,432,475	1,574,955	2,135,037	2,966,142	2,374,000	64,538,513
	Daily average	531,798	479,063	645,781	110,725	50,805	68,872	95,682	108,839	2,091,565
February:	Month	14,930,932	13,531,980	18,957,571	3,341,016	1,402,492	1,981,616	2,747,024	3,129,000	60,021,631
	Daily average	533,248	483,285	677,057	119,322	50,089	70,772	98,108	111,750	2,143,629
March:	Month	16,364,842	14,627,687	23,453,619	3,498,598	1,469,245	2,061,576	2,898,035	3,374,000	68,747,602
	Daily average	527,898	536,377	724,310	112,858	47,395	66,502	93,485	108,839	2,217,665
April:	Month	15,803,541	16,215,990	26,887,717	3,281,880	1,412,220	2,008,921	2,901,870	3,273,000	72,384,239
	Daily average	526,785	559,255	896,257	109,396	47,074	66,934	96,729	109,100	2,412,808
May:	Month	16,448,960	17,333,867	28,708,684	3,341,366	1,446,274	2,232,568	3,098,419	3,190,000	75,800,133
	Daily average	530,612	559,157	926,086	107,786	46,654	72,018	99,949	102,900	2,445,166
June:	Month	15,641,436	16,678,200	29,139,833	3,175,440	1,344,450	1,850,511	2,986,200	3,166,000	73,982,070
	Daily average	521,381	555,940	971,327	105,848	44,815	61,684	99,540	105,533	2,466,069
July:	Month	16,093,322	16,420,080	33,827,213	3,089,532	1,287,585	1,715,730	2,905,909	3,341,000	78,680,671
	Daily average	519,139	529,680	1,091,200	99,672	41,535	55,345	93,739	107,774	2,538,078
August:	Month	15,668,984	9,517,279	32,279,816	3,141,323	1,165,569	1,584,444	2,807,143	3,167,000	69,331,558
	Daily average	505,451	307,009	1,041,284	101,333	37,599	51,111	90,553	102,161	2,236,563
September:	Month	15,180,610	7,946,380	28,981,525	3,147,030	1,138,380	1,441,384	2,761,230	3,032,000	64,429,039
	Daily average	506,020	264,896	966,051	104,901	37,946	54,713	92,041	121,067	2,180,961
October:	Month	15,651,983	12,951,893	30,735,173	3,177,066	1,172,389	1,832,255	2,797,597	3,900,000	72,198,356
	Daily average	504,903	417,803	991,134	102,486	37,819	58,782	90,247	125,807	2,328,979
November:	Month	14,997,700	16,430,730	28,860,561	3,131,670	1,130,700	1,851,577	2,706,390	3,639,000	72,748,328
	Daily average	499,923	547,691	962,018	104,389	37,690	61,719	90,213	121,300	2,424,944
December:	Month	15,560,984	16,598,299	27,767,651	3,198,642	1,082,148	1,971,817	2,816,759	3,645,000	73,641,299
	Daily average	501,967	535,429	903,860	103,182	34,908	63,607	90,863	117,581	2,363,261
Total 12 months		188,329,032	175,703,848	328,608,575	38,956,328	15,626,407	22,856,536	34,392,718	40,320,000	845,803,454
Daily average		517,340	481,370	900,297	106,730	42,812	62,621	94,227	111,863	2,317,270